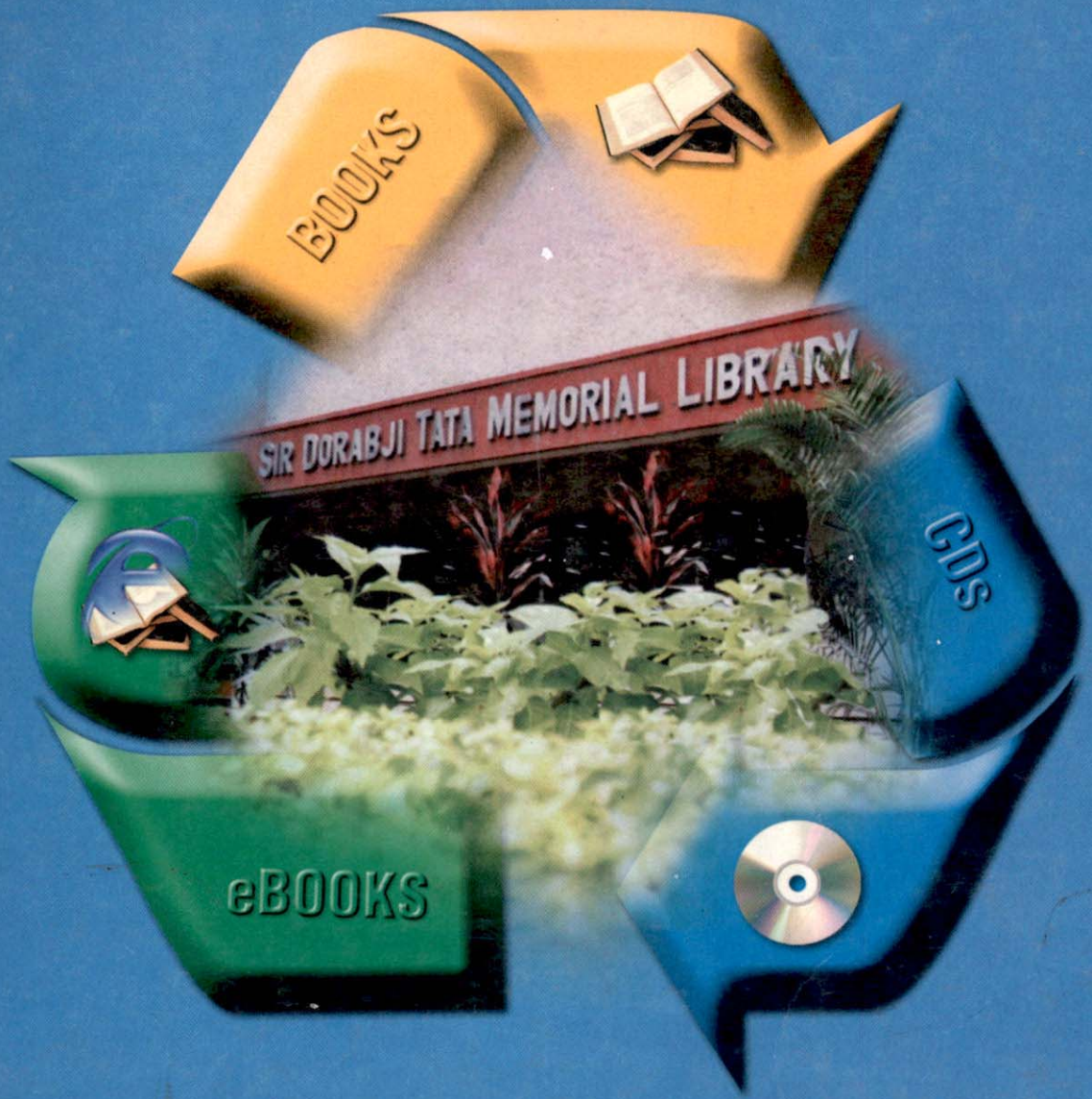
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FOREWORD

Libraries have a key role to play in underpinning learning in its broadest sense, both as a formal activity in an institution and informally within the community. Libraries in the knowledge society are much more than book repositories. They are not just performing traditional task in a new environment such as preserving the cultural heritage, but provide greatly extended services to millions of users such as students, researchers and other professionals as well as public at large. These days' libraries are fast becoming treasure houses of digital content as well as creators of unique digital content for themselves. Further libraries have a fundamental role to play in the development of strategies for lifelong learning. In addition to serving as place of service, libraries are active partners in offering access, technical guidance and training to global information resources as a whole.

The classical manufacturing based economy works by taking raw materials and turning them into goods which might involve diminishing returns. In the knowledge based economy, on the other hand, returns increase; ideas are not scarce materials, as knowledge builds on knowledge. Knowledge is very crucial for growth and development of the country. It is one of the most important factors that influences sustainable competitive environment in the modern knowledge society. The knowledge is not evenly distributed among people in the society due to varied reasons such as social, economic, political, regional, gender etc. The knowledge rich have always ruled over those having constrained access to knowledge. The need of the hour is to bridge this knowledge gap – democratize creation and access to knowledge. There is an urgent need for contemporary research to address the dynamics of knowledge, which are fundamental in understanding the knowledge flows. Library and Information centers and professionals are best suited for the purpose and have a greater role to play in bridging knowledge gap among different communities in the society.

Dr. S. R. Ranganathan, pioneer in the Library Science movement in India introduced the concept of 'Open Access' system in libraries way back in 1925. The idea behind this was to make information and knowledge accessible to all. Implementation of 'Open Access' system had the result of educating more people, making information available to all, and even aiding women and minorities in the Information seeking process. This gave impetus to readers to come quite often to the Library.

With the advent of Internet, the concept of 'Open Source' gained momentum. There are many open source software available today which can be explored and used gainfully for many of the activities. The Open Archive Initiative (OAI) is also closely related to open access publishing movement which is a defining example in the direction of making the information available to all.

I wish to mention that Sir Dorabji Tata Memorial Library, Tata Institute of Social Sciences, Mumbai in collaboration with the Network Institute for Global Democratization (NIGD), Helsinki organized an International workshop on 'Democratization of Information: Focus on Libraries' on 18th January 2004. Many issues related to library advocacy to democratization of information were debated at

length. The present conference with the theme "Knowledge for All: Role of Libraries and Information centers" is timely and befitting the context. This conference is indeed being organized at the right time.

This international academic event is covering the complete gamut of issues that are facing the modern day society. It is very much essential to overcome the barriers of knowledge sharing, bridge the information gap and make the information accessible to all thereby empowering every section of the society.

I am sure that the outcome of this conference will be very relevant and timely to India and other countries in Asian Region. Dr. Muttayya Koganuramath, University Librarian and his colleagues have done a commendable work in organizing this mega event. I also thank several other colleagues Prof. E. Rama Reddy, Prof. C. R. Karisiddappa, Prof. Jagtar Singh, Prof. Harsha Parekh, Prof. A. C. Tikekar, Dr. B. S. Kademani, Mr. Naville Tuli and Dr. Sangayya Sirurmath who have made significant contribution to the planning and implementation of this conference.

I wish the conference a great success.

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PREFACE

Knowledge society is a society in which the creation, distribution, use, integration and manipulation of knowledge is unabatedly going on. In the present context knowledge is considered far more important primary production resource. The process of sharing, creating and using knowledge is focused for the prosperity and well being of its people. Fritz Machlup, introduced the concept "Knowledge Industry" as early as 1962, has distinguished the five sectors of knowledge Industry: education, research and development, mass media, information technologies and finally information services.

Talking about economy in the knowledge society, Peter Drucker has said that there is a transition from an economy based on material goods to one based on knowledge. Alvin Tofler wrote that in a Third Wave economy, it is the actionable knowledge which is the central resource, a single world broadly encompassing data, information, images, symbols, culture, ideology and values. Similarly, several leading authors like Daniel Bell, Jean-Francoise Lyotard, Bell Peter Otto and others have repeatedly emphasized the significance of knowledge in the present society.

As information services are one of the key factors of knowledge industry, agencies and institutions providing information services are very critical for the functioning of knowledge society. It is here that the role of libraries and information centers is considered significant. The education and research are the solid pillars of knowledge society. The indispensable support from libraries and information centers is clearly visible. Be it institutes of higher learning like university, college, corporate and industrial library or a public library meant for common public, libraries have redefined their roles according to the changing contours of the society. Like the societal transformation from agricultural society to industrial society to the present knowledge society, libraries have also reengineered their services and have struggled hard to remain relevant to the societal needs. The main aim of this international conference is to understand better the role of libraries and information centers in the knowledge society.

The theme of the conference "Knowledge for All: Role of Libraries and Information Centers" is timely and attracted the attention of the professionals who have contributed in large number. There are contributions from Teachers, Practicing Librarians, Corporate Librarians, School Librarians, Public Librarians, Computer Scientists, etc. The sub-themes are very well reflecting the main theme and are encouraging the authors to identify their area of expertise and write papers accordingly. Another interesting point to note here is the active participation of young professionals who have shared their practical experiences and also integrated the theoretical aspects appropriately.

Editorial committee acknowledges with thanks the authors for their interest. All possible efforts are made by the editorial committee to keep up the standard and quality of the conference volume without affecting the thought process and ideas of the authors.

Editorial committee is acknowledging the sincere efforts of reviewers Prof.Harsha Parekh, Dr.T.S.Kumbar, Dr.A.L.Moorthy, Dr.Ramesha, Dr.Suresh Jange and Ms.Sangeeta Kaul who could respond to the request and maintained the time frame and enabled the committee to complete the tough task of finalizing the press copy. Editorial committee would like to place on record the timely direction and encouragement of the Editorial Advisory Board. Last but not the least; committee appreciates the active support of M/s. SITA PUBLICATIONS for publishing this volume so elegantly within a short span of time.

It is hoped that the deliberations at this international conference would be of some value and rewarding for the delegates and more particularly the proceedings would be a useful source of reference to the professionals who are engaged in various activities. Editorial committee is eagerly looking forward to have pleasant and stimulating interactions and fruitful meeting with the delegates at the convention on 12th November 2008.

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Dr. Muttayya Koganuramath

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Dr. Muttayya Koganuramath started his career as Librarian, Karnatak Regional Engineering College (NIT) Surathkal and is presently working as the Librarian, Tata Institute of Social Sciences, Mumbai. He has over 30 years experience in managing Science & Technology, Social Science libraries and is an accomplished person in the library and information science fraternity in India. He was awarded TCTP fellowship, British Council, U.K. (1992) and Library Fellow under South Asia Renovating Collection (1998) Australia. He is widely travelled and has interacted with libraries across the world like Britain, Australia, France and Netherlands, etc. So far he has published 8 books and 50 research papers in national and international journals. He has organized four national conferences, one international workshop and many refresher courses. He was president of the Indian Library Association during 2004-2007. At present he is the chairman of BOSLA, Mumbai

Dr. (Mrs.) R. Chandra



Dr. (Mrs.) R. Chandra retired as Scientist-E from Institute of Nuclear Medicine & Allied Sciences (INMAS), DRDO, Ministry of Defence, Delhi. She has to her credit many research papers in National and International journals of repute, chapters in books and has also edited 6 books. She was associated as Assistant Editor of the journal "Indian Journal of Nuclear Medicine" for 5 years. She is the First Recipient of GM Kumar Award for the Best Paper. She also received S. J. Kulkarni Award for the Best Medical Librarian instituted by Medical Library Association of India and she was presented DRDO Lab. Technology Group Award. She is associated as Editorial Member of ILA Bulletin, an Official Organ of ILA. She was Secretary of Indian Library Association from 2005 to March 2007 and at present is the General Secretary of Indian Library Association, the First Woman to hold the post in the history of ILA.

Dr. Sangayya S. Sirurmath

(M.L.I.Sc., M.A., M.Com., PGDLAN, Ph.D.)



Dr. Sangayya Shirurmath is presently Vice President (Library), Center for Archiving, Research and Development, Osian's-Connoisseurs of Art Pvt., Ltd., Mumbai. He holds a Ph.D., in Library and Information Science from the Bangalore University. His area of specialization includes, design and development of virtual information services, research methodology and personnel management. He also worked as Librarian and Head (National Information Center for Management) - Indian Institute of Management, Ahemedabad; Chief Librarian at XLRI-School of Management, Jamshedpur; Deputy Librarian, Siddaganga Institute of Technology, Tumkur and Librarian, P.M.N.M Dental College and Hospital, Bagalkot. He has 20 years of experience in medical, engineering, management, art and culture libraries. He has coordinated several Management Development Programmes, organized and attended national conferences and has 25 publications in reputed journals, books chapters and conference proceedings. He has published a book on "Electronic Libraries". He was awarded 'Best Archivist-2007' by Osian's-Connoisseurs of Art Pvt., Ltd., Mumbai. He is a member of many professional associations like ILA, IASLIC, BOSLA, SIS, ADINET, KLA and MANLIBNET



Dr. Mallikarjun Angadi

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Dr. Mallikarjun Angadi is presently working as Information Scientist at Tata Institute of Social Sciences, Mumbai since 1998. He has Masters Degree in Library and Information Science with Gold medal from Gulbarga University, Gulbarga and also Post Graduate Diploma in Computer Applications from the same university. His area of specialization includes Web Designing, Digital Library Applications, Web Authoring, Network Based Information Services, Scientometric applications to Nobel Laureates etc. He has published 24 research papers in the national & international conferences/seminars and 2 research papers in the international journal. He also visited Sweden, Denmark, Finland, Malaysia, Singapore and Sri Lanka as part of academic activities. He received USA-IVLP Fellowship for one month in 2007 from US Dept. of State and visited many advanced libraries in USA like Library of Congress-Washington DC, University of Columbia-New York, University of Illinois-Urbana Champaign, Illinois Institute of Technology-Chicago, Montana State University-Bozeman etc. He is a member of ILA, ALA and BOSLA



Dr. Satish Kanamadi

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Dr. Satish Kanamadi is presently working as Assistant Librarian (Sr) at Tata Institute of Social Sciences, Mumbai, since 2002. He obtained his Master of Library and Information Science from Karnatak University, Dharwad and was awarded Prof. M.R.Kumbahar and Shri. Siddappa Manvi Gold medals. He was also awarded Junior Research Fellowship from UGC. With over 13 years of professional experience, his areas of specializations are Information Literacy, Knowledge Organization and Retrieval, Web Resources, Training and development. He has published over 14 research articles in International and Indian journals and conference proceedings and has been the coordinator of UGC Refresher Courses. He has served on the editorial board of LIS professional newsletters like ILA and BOSLA.



Dr. N. S. Shokeen

Dr. N. S. Shokeen is an academician with more than 25 years of practicing librarian and did his doctorate from Agra University. He has to his credit 5 books and various research articles. He has been involved as a Member in various syllabus revision Committees. Dr. Shokeen has been nominated twice as the Vice President and Council Executive Member of ILA. He has participated in various conferences, seminars and workshops. He is a Member of 12 National/State Associations. Dr. Shokeen was one of the Faculty Members of Indian team to Royal Institute of Bhutan during Nov. 2006 for imparting training in Library and Information Science. He is currently working as Head of the Dept. of Library and Information Science, Kalpana Chawla Govt. Polytechnic for Women, Ambala City.



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Shri. Puttaraj is working as Assistant Librarian, Tata Institute of Social Sciences, Mumbai. He has started his career in Librarianship from INFLIBNET CENTRE, Ahemdabad in 1999. Later he worked with Pillais' Institute of Information Technology, Engineering, Media Studies & Research (PIIT), New Panvel as Librarian. He is a Life Member of ILA, BOSLA and SALIS. He has attended and organized many conferences, workshops and seminars. He has eight publications and two edited books to his credit.

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Access to Knowledge and Issue of Information and Digital Literacy in Developing Countries

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1. INTRODUCTION

The growth of digital paradigm is visible in all walks of life throughout Asia. Like other institutions, libraries are also developing and redesigning IT-mediated services. However, the pace of ICT adoption depends on the human and financial resources available as well as the social and political commitment to such adoptions. Pakistan has witnessed the most significant ICT developments in the higher education sector. There are 117 universities and degree-awarding institutions in Pakistan, and the government has invested significant funds to help raise the quality of higher education through various means. For example, the Higher Education Commission of Pakistan (HEC) claims:

The HEC is dedicated towards meeting the development challenges and opportunities that the recent rapid evolution in information and communication technologies (ICT) has brought about, so that these can be effectively leveraged to address fundamental development challenges of poverty reduction and sustainable economic development (www.hec.gov.pk)

However, studies conducted on the use of PU libraries and HEC National Digital Library (NDL) reveal that academic community is seriously ignorant of the prevalent knowledge reservoirs and information services (IS). It appears one a major barrier in the utilization of the libraries on campus and HEC NDL. The under utilization makes it difficult to meet the national goal of using ICT for research, development and economic growth. This state of information and digital *illiteracy* is responsible for a significant loss of nation's resources as large amount of funds is being spent on establishing L&I Services. It also reflects a systemic failure of education because it does not recognize the need of education of IDL. It is assumed that this state is not unique to Pakistan, but other developing countries face more or less the same state.

Against this background, the paper discusses the need of information and digital literacy (IDL), and then discusses the general drawbacks to effective IDL in developing Asian countries in the light of available literature. Finally, the paper probes the extent to which IDI is a barrier to the effective use of digital library services, and what measures need to be taken to remedy this situation in developing countries like Pakistan.

To Discuss at length what Information and Digital Literacy is, how it may be imparted, its different stages, foundations, models etc. is out of scope of this paper.

2. LITERACIES DEFINED

2.1 Information Literacy (IL)

There appeared plenty of literature on different aspects of IL. Numerous definitions, a number of models, various stages and theories of IL are available online and offline. It appears that the breadth

and depth of the subject in the 21st century has further expanded. The role of professional associations such as ALA, IFLA, ALP, CILIP, volunteer efforts on Web and UNESCO is significant in promoting IL. Among the definitions available following one by US Association of College and Research Libraries (ACRL) has been widely quoted, "Information literacy is a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." (2000). However, Dorner and Gorman (2006) take a critical review of this definition and emphasize that western or developed world's definitions and models may not be operational in the developing world. They assert:

There are serious shortcomings with the definition of information literacy when it is applied to developing countries..... IL in developing countries in particular must involve the development of a capacity within local communities and local cultures to critique existing knowledge found by means of effective information literacy and to construct new knowledge on the basis of this critique.

Since paper deals with the IDL in developing countries, therefore, Dorner and Gorman's following operational definition of information literacy has been adopted:

The ability of individuals or groups;

- to be aware of why, how and by whom information is created, communicated and controlled, and how it contributes to the construction of knowledge
- to understand when information can be used to improve their daily living or to contribute to the resolution of needs related to specific situations, such as at work or school
- to know how to locate information and to critique its relevance and appropriateness to their context
- to understand how to integrate relevant and appropriate information with what they already know to new construct knowledge that increases their capacity to improve their daily living or to resolve needs related to specific situations that have arisen. (2006)

Digital Literacy (DL): DL considers the broad range of resources that are accessible online and underscore the importance of looking at each of these resources with a critical eye (Eisenberg, et. al, 2004). I would emphasize to include the ability to locate, access and use information in network environment.

2.2 Information & Digital Illiteracy (IDI)

It may be stated as educated individual's state of being unable to recognize, locate, evaluate and use information to fulfill, precisely or loosely, identified information needs.

Aims of the Study:

- Briefly overview the IDL developments
- Probe the extent to which literacy is a barrier to the effective use of digital library services in developing countries with specific reference to Pakistan, and
- Suggesting measures need to be taken to improve the state of I&DL situation in developing countries like Pakistan.

A brief overview of IDL in developed and developing world

LIS professionals deserve applaud for their commitment to the development of humankind by making people understand their information and knowledge needs; rather they go to farther by striving to induce lust-for learning and knowledge. Growing with the ever-changing scenario, LIS professionals

learned that they have the responsibility towards the utilization of huge information reservoirs either housed in bricks or running through wires and not merely organizing and housing them— To plead for providing reference services, applying Laws of Ranganathan, marketing of LIS, library orientation and now IL, DL etc. all aimed at assisting in the optimum transferring of knowledge from physical artifacts to minds and vice-versa to keep the circle of knowledge grow.

Literature traces the roots of information literacy back to 1974 when Zurkowski presented the concept of IL in a report presented to the National Commission on Library and Information Science (NCLIS) in the USA stating, "people trained in the application of information resources to their work can be called information literates" (p.6). Interestingly, one finds roots of almost every modern LIS professional development in the USA but Ranganathan's Laws. A historical overview of subsequent developments presented by Behrens (1994) establishes that very soon the idea got developed into a popular philosophy and practice by LIS specialists.

IL, which has been known as library orientation, bibliographic instruction, user education and information skills, is a sophisticated way of instructing people, from the very beginning of their educational career, to form "the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning" (ACRL, 2007).

Due to ICT revolution in the 21st century, the list of needed literacy skills goes on expanding including IT literacy, digital literacy, computer literacy, networking literacy, media literacy etc. While discussing these terms, Webb (2004, p. 12) quote Badwen as follows: "the name and exact definition matter rather less than a recognition that 'to deal with the complexities of the current information environment, a complex and broad form of literacy must be required', which must 'be actively promoted as a central core of the principles and practice of information science' (Badwin, 2001, p.251)". Horton describes the family of 21st Century 'survival literacies' that includes six categories: (1) The Basic or Core functional literacy fluencies (competencies) of reading, writing, oralcy and numeracy; (2) Computer Literacy; (3) Media Literacy; (4) Distance Education and E-Learning; (5) Cultural Literacy; and (6) Information Literacy. The boundaries between the various members of this family overlap, but they should be seen as a closely-knit family (p. 3). The web resource created to support the AT&T/UCLA (2002) Initiatives for 21st Century Literacies presents the overlapping of skills in the following figure:

Types of Literacies

Singh (2008) emphasis on the role of IL in the lifelong learning while addressing the dilemma of illiterate people as follows:

Information literacy is a tool for lifelong learning and self-actualization. It is the ability to access, process, evaluate, and use the needed information strategically for obtaining one's mission and vision. UNESCO is celebrating the United Nations Literacy Decade ' (2003-12) as well as promoting the 'Education for All Programme (EFAP)' and the 'Information for All Programme (IFAP)'. But can there be information for all without education for all? Certainly, education is the foundation for developing independent learners and critical thinkers.

To learn expanded range of literacies is as serious a need for 'educated community' of the developed countries as learning just 'literacy' (basic education) for billions human-beings residing in less-developed and developing countries. IDL is none of their business. Despite UNESCO's global campaign of Education for All (EFA) and local government's efforts, millions of children many Asian countries are

deprived of even primary education, and are forced to do labor for daily living. Unfortunately, uneducated people are not our business at this moment, as the paper focuses on drawbacks of IDI for the educated elite in the developing countries.

The state of IDL training amongst the educated population is bleak at all levels, from primary to higher levels of education in countries like Pakistan, India, Bangladesh, Sri Lanka etc.. Literature search demonstrates that massive range of online and offline writings on IDL are available in the developed world. The way it has been integrated with the education system from early to the higher education is commendable. LIS experts have worked hard in this regard in USA and Australia. ACRL has developed a very useful website on IL for novices and for practicing librarians (www.ala.org/ala/acrl...).

Eisenberg (2004) argues that "the concept of IL is embraced throughout the world. Both rich and poor countries recognize that education in IL skills is essential to produce a workforce of flexible, lifelong learners which is increasingly a prerequisite to economic development" (p. 32). However, the author gives only a couple of examples regarding IL from Namibia and South Africa representing poor countries and no mention of any Asian country. It is hard to agree with the authors that IL has been embraced worldwide as even from Canada, Dakshinamurti and Braaksma (2005) affirm that most of research and activity in IL in the last decade has been done in the United States and Australia. In Canada, as in Europe, the IL picture and the role of librarians as teachers are less developed (p. 117).

IDL has just begun at primitive levels in the developing and poor countries. Only a few works about or from the under developed regions of South-East Asia on the subject have been found. Pakistan's situation is even worse. It may be termed as another kind of divide or disparity between the both worlds: IDL divide.

Nevertheless, some efforts and works on IL/DL relating to developing countries in Asia are worth mentioning. A web portal InfoLitGlobal project which is "financed by the Division of Information Society of UNESCO, and is carried out by the Information Literacy Section (InfoLit) of IFLA on behalf of UNESCO, with the voluntary research work of InfoLit Standing Committee members" is a tremendous source for helping LIS professional to impart IDL. Its goal is to "identify what has been done in regard to Information Literacy (IL) around the world, and the actions that are required at international level to create an international literacy agenda for citizens of all walks of life. The proposed outcome is a schematic report, a database and a website". It is a valuable site for LIS professionals in developing countries to literate themselves.. The International Guidelines on Information Literacy have been also compiled by the InfoLit "with the aim of providing a pragmatic framework for those professionals who need or are interested in starting an information literacy program" (http:// www.ifla.org/VII/s42/pub/IL-Guidelines2006.pdf).

UNESCO sponsored workshops series 'Train the Trainer (TTT)', for the education of librarians in IL is very laudable. These workshops are being organized in different regions of the world by different LIS schools. A High-Level Colloquium on Information Literacy and Lifelong Learning (2006) was held at Bibliotheca Alexandrina, in Egypt with the aim of "developing practical agendas for raising awareness and promoting IL and lifelong learning skills" (p.5), and spreading it through international and national programs on IL. Its proclamation emphasized, "governments and international organisations to pursue policies and programmes to promote ILand lifelong learning because they are essential to inclusion, economic development and quality of life in today's Information Society" (p. 9). Then, the Society for the Advancement of Library and Information Science (SALIS), India, in collaboration with UNESCO launched a six-month project entitled Interactive E-Learning Portal on Information

Literacy Competency Development Skills for South Asia. The project aims to raise awareness and enhance information literacy competency skills of laypersons as well as information professionals and educators. It has lessons, modules and videos to impart IDL.

The development of the model "Empowering 8: the information literacy model in Sri Lanka to underpin the changing education paradigms of Sri Lanka ...." is also worth mentioning. It was developed keeping in view the peculiar situation of Asian developing countries.. A UNESCO sponsored study by Dutta (2008) mainly focused on to investigate the reading habit of various communities of Kolkata. This study illustrated information seeking behaviour of diverse groups of habitants, including youths, women, industrial workers and elderly persons. The report concluded that despite the electronic media boom, reading still survives. It suggested imparting information literacy competency and lifelong education to marginalized groups through public library networks in the country. This brief overview presents that efforts for IL have just begun in the developing world, at varied levels and in an non-integrated manner

State of I & DL in Pakistan

This part presents the case of Pakistan with local references with the assumption that more or less the region faces similar conditions regarding IDL. Before talking about IDL, it seems appropriate to look at some figures about Pakistan. According to the Government of Pakistan, the population of the country is 163,332,500.

The proposed draft of national education policy 2008 states, "Education is a categorical imperative for individual, social and national development that should enable all individuals to reach their maximum human potential. The system should produce responsible, enlightened citizens to integrate Pakistan in the global framework of human centered development" (p. 5, http://www.moe.gov.pk/)

The proposed policy states that 3% of GDP was spent on education in 2006-07 (2.5 government and 0.5 private sectors) and enrollment of students in public sector was 64% at all levels, from primary to university.

The enrollment was 424,012 in Universities from 2005-2006 and 419,231 in professional institutions. It makes total of 843,243; which is only 1 percent of the 52% literate/educated population and 0.5% of the total population of the country.

This academically elevated community is expected to contribute in the national growth through excellent use of knowledge and information reservoirs available around so that the dream of developing "knowledge society" may come true.

3. AN OVERVIEW OF KNOWLEDGE & INFORMATION SERVICES AVAILABLE TO PU COMMUNITY

3.1 HEC Resources (www.hec.gov.pk)

The HEC has aimed to ensure that a comprehensive Information and Communications Technology strategy is implemented in our goal to develop a knowledge-society in Pakistan. A host of programs have been introduced to establish a world-class ICT infrastructure provide high-speed internet connectivity to universities across the country. These initiatives lay the platform for the delivery of a range of ICT-based educational services, including a world-class Digital Library and Video Conferencing Facilities amongst many others... By helping to bridge the digital divide between institutions in Pakistan and the developed world, and providing our research community with the tools

and skills to maximize the potential of ICT as a mechanism for economic development, the HEC aims to assist our nation in achieving sustainable economic growth and future prosperity for all our citizens. The resources provided by HEC to meet its goals are as under:

- Availability of over 30 databases providing access to over 23,000 full text journals from the world's leading publishers
- DL accessible by approximately 250 institutions (Public Universities, Private Institutions, R & D Organizations)
- Access to collection of over 150 million items available through British Library Document Delivery Service
- The Higher Education Commission (HEC) has launched ebrary and McGraw Hill Collections to provide 45,000 online books. (http://www.digitallibrary.edu.pk/)

3.2 PU Library Services (www.pu.edu.pk)

The following information has been extracted from the university webpage. It describes that: *Punjab University Library is the largest resource center of knowledge and information in Pakistan, which came into existence in 1882.At the time of the birth of Pakistan, there were 1,44,204 books in the Library. At present its total collection is 4,42,300 approximately including some very precious personal/special collections such as : 22574 manuscripts; 65200 bound volumes of national and international research journals; more than 50,000 volumes of old documents published during the 1850s to 1920; 1750 microfilms of rare material and, UNO publications.*

In addition, each teaching department/ Institute/ Constitute college has its own library where books and research journals, mainly in the respective specialized areas provided. Some of the biggest libraries are those of Oriental College, Law College, Hailey College of Commerce and Institute of Islamic Studies, Department of English and Institute of Chemistry. These libraries also receive many periodicals and research journals. The total number of books in all the University libraries is over 720,000. The Library has developed Online public access catalogue (OPACs) terminals are available for searching. A computer lab with 100 computers is available.

3.3 Information and Digital Illiteracy (IDI): A Barrier in Use of Available I& K Services

In the PU, most of the faculty members and other staff members have been provided PCs with online access to HEC subscribed databases and PU Library. The central library has gradually upgraded its services as compared to the past. It may be called now a hybrid library. But the studies conducted at PU establish that utilization of the available resources is not optimal. It appears that the level of IDL is considerably low among its community. Following section presents the selected results of the surveys made during recent years on the use, awareness, and issues of I&K services of central and institutional libraries on campus.

Tahira (2008) studied information needs and seeking behaviour of science & technology teachers of the PU as part of MPhil Degree requirement in LIS under the supervision of the principal author. It was based on a survey of population consisted of all full-time teaching staff of S&T faculty members (220) and got response from 156 (71%).

The relevant extracts of data analysis from the study are presented, with the permission of the researcher, to portray the state of IDI and its impact on the use of available traditional and digital information services

Formal Orientation and Use of Online Databases

Since IL plays very important role in the appropriate use of information sources. It was considered important to know respondents' views about need of formal orientation regarding the use of online databases. Table 1 shows a considerable majority felt the need for formal orientation.

Table 1. Need for formal orientation in future (N=156)

n	Yes	No
111	75(68%)	36(32%)

Adequacy of HEC Subscribed Databases

HEC subscribed databases are fundamental source of on campus e-access HEC claims devising "various material including posters and pamphlets, a comprehensive website and one window search interface known as the ELIN system has been developed to promote awareness and access of these sources" (Said, 2006, p.14). However, Table 4 presents that these databases were fulfilling the information needs of S&T faculties of PU only 'to moderate extent' (μ= 2.58). Hence, the adequacy level of HEC databases is not optimum.

Table 4. Descriptive Statistics of level of Adequacy of HEC databases in Meeting Respondents' Information Needs (N=156)

HEC subscribed data bases	N	Min	Max	Mean (μ)	Median	Mode
adequate to meet requirement	154	0	4	2.58	3.00	2

To great extent =4; To moderate extent = 3; To some extent = 2; Not at all= 1; Never used =0

The study finds that a major reason of finding HEC databases inadequate is the lack of awareness among community and librarians about them. Resultantly, the subscribed databases are underused. It also revealed inadequate level of staff performance and motivation in meeting information needs of the community.

Studies of PU libraries and library services by other researchers broadly confirm these findings regarding Universities information system. Naz, (2007) suggested more staff needed to guide and provide DL to students in OPAC use. Hussain (2006) explored the perception of LIS professionals regarding digital library and revealed that "IT literacy rate is very low in Pakistan which is basic problem in setting up digital libraries". Saddique's (2006) case study aimed to make appraisal of the reference and information services of PU library in a qualitative manner. Following comments of interviewed students illustrate the state of IDL:

"I have been coming in the library for one and half year, I heard about this section from you"; "is there any section by this name"?; "I think that this section served only those students or teachers who are doing M.Phil, PhD and other research work"; "I think this section is providing fee-based services and we will have to pay something before entering this section".

The study revealed that the vague perception about the IRC causes less use of I&K services to meet their academic needs. Low digital literacy rate, coupled with shyness, make users not to ask for any assistance in searching electronic resources. The staff also confirmed that users are not very familiar with online searching skills. The study concluded that in spite of the polite behavior of staff, users were not comfortable asking their queries due to their own inhibition. It suggested extensive IL programs be started for the optimum use of information and reference services. Sumreen (2006) found

that most users of the PU institutional libraries understood reference and information services to be limited to the provision of reference books, internet facility and help in using these resources.

It may be safely concluded that IDL is practiced in a few university libraries and that too at the primitive stage such as library orientation tour of new classes. Embracing IDL with educational programs for lifelong learning is a dream, which has not been dreamt yet at national level. Neither government nor LIS educators nor professionals have given it the due thought.

The soaring rate of prevalent IDI or lack of I&DL amongst the highly educated community is a real issue in the development of knowledge society. Needless to mention if decision/policy makers and think tank are not I&DL they cannot make well informed and well planned policies. As a result, it most likely makes already limited resources go into waiste.

Poor state of IDI at higher education institutions is as alarming as the poor literacy rate at masses level. The need of IDL is self-evident. To be able to identify and acquire precise, quality information, to make critical analysis of it and to synthesis it into knowledge lead to the development and empowerment of individuals and nations. One can find countless examples of poor planning and management in all fields in Pakistan, from education to economic to trade and so forth. It is because the decision makers may be experts in their field but not I&DL.

Suggestions

Having thrown light on the state of IDI prevalent at the higher education level, it seems essential to furnish the possible, workable ways to improve the situation in Pakistan and other developing Asian countries with more or less similar conditions.

4. ROLE OF LIS COMMUNITY

At the first place, the LIS schools and professional associations will have to accept their responsibility to focus on IDL and take different measures simultaneously such as:

4.1 Training faculty and professional leaders

IDL will have to begin and foster with the training of people responsible for instructing IDL. ALP training workshops and The UNESCO TTT series (Train the Trainers in IL) has been planned to train people of developing countries. For example the one in India going to be held in November is focused on the South and Central-Asian region, and before that one in August 2008 in Malaysia. The LIS schools and professional associations should make it possible to send the persons, with potential interest in the area, for training. It will enable them to train the trainers through regular as well continuing professional development plans back home.

4.2 Research and development

LIS community needs to conduct research to find out the types of literacies needed, and to develop training modules keeping in view their peculiar environments and demands. University libraries need to come forward and focus on imparting IDL.

4.3 Creating awareness

It is direly needed to create awareness among policy makers at every level regarding integrating ICT developments with IDL for economic development through building knowledge society. Again, LIS academia and associations have to play their role in this regard.

5. ROLE OF GOVERNMENTS

5.1 IDL and education program

From primary to higher level, the education should be resource based and IDL instruction must be part of teaching programs of public and private sector institutions. Only then developing countries leads towards becoming knowledge society, gradually. IDL will enable people make well informed, critically analyzed decisions, based on quality information, at personal and national level.

5.2 Human Resource Development (HRD)

Governments, Universities and other higher authorities must facilitate HRD in this regard. The needed resources for HRD in IDL skills should be provided in order to achieve the goal of more and more IDL rate, at the least in the higher education institutions..

6. CONCLUSION

The study portrays alarmingly low level of ICT literacy and its impact on the progress of developing countries. It suggests that transformation of Asian countries into knowledge societies can be possible only through the development of IDL programs ahead of the development of ICT infrastructure. It needs to be imparted at every level of education. Specifically, at higher education institutions, IDI is as serious an issue as is illiteracy at masses level. IDI is a big barrier on the way of real progress of developing countries. Therefore, immediate attention of all the concerned quarters is direly needed for making long-term and short-term plans to raise the level of IDL.

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Analytical Study of LIS Institutional Repositories on DOAR

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Abstract: Open Access and Institutional Repositories is one of the most popular terms in the library and information science community. Institutional repositories (IRs) have increasingly been deployed in academic institutions in order to organize, preserve, access, and facilitate use of digital content produced by members of their communities. This paper is a survey LISIRs of DOAR (Directory of Open Access Repositories). Total number of LIS Institutional Repositories analyzed was 48 based on selected study criteria like software used for repositories, size of the items, contents included, languages, policies, description, remarks and Country.

Keywords: Institutional Repositories, Open Access, LIS

1. INTRODUCTION

An Institutional Repository is an online locus for collecting, preserving, and disseminating the intellectual output of an institution, particularly a research institution. For a university, this would include materials such as research journal articles, before and after undergoing peer review, and digital versions of theses and dissertations, It might also include other digital assets generated by normal academic life, such as administrative documents, course notes, or learning objects.

The four main objectives for having an institutional repository are:

- to create global visibility for an institution's scholarly research;
- to collect content in a single location;
- to provide open access to institutional research output by self-archiving it;
- to store and preserve other institutional digital assets, including unpublished or easily lost literature (e.g., theses or technical reports).

2. DIRECTORY OF OPEN ACCESS REPOSITORIES (DOAR)

DOAR is being developed and maintained by the University of Nottingham as part of a portfolio of work in Open Access and repositories under the SHERPA umbrella. DOAR was started and initially developed by the University of Nottingham, UK, and the Lund University , Sweden.The project is being funded by the Open Society Institute (OSI), the Joint Information Systems Committee (JISC), the Consortium of Research Libraries (CURL) and SPARCEurope.The Directory of Open Access Journals (DOAJ) is the sister project of *Open*DOAR and together they offer two infrastructure supports for the growth of Open Access in research and scholarly community. DOAR is a project to list and categories academic open access research repositories.

DOAR aims at:

- Surveying the growing field of academic open access research repositories and categorizing them in terms of locale, content and other measures.
- Producing a descriptive list of open access repositories of relevance to academic research.
- Providing a comprehensive & authoritative list for end users wishing to find particular types of, or specific repositories.
- Delivering a comprehensive, structured and maintained list with clear update and self-regulation protocols.
- Playing a prominent international role in the organization and access to open access repository services.
- Supporting Open Access outreach and advocacy endeavors within institutions and globally.

The DOAR service provides a quality-assured listing of open access repositories around the world. DOAR staff harvest and assign metadata to allow categorization and analysis to assist the wider use and exploitation of repositories. Each of the repositories has been visited by DOAR staff to ensure a high degree of quality and consistency in the information provided: DOAR is constructing a comprehensive and authoritative list of institutional and subject-based repositories. It also encompasses archives set up by funding agencies like the National Institutes for Health in the USA or the Welcome Trust in the UK and Europe. Much valuable work has already been conducted in listing repositories in different countries and DOAR is building on this existing knowledge. DOAR is therefore primarily a service to enhance and support the academic and research activities of the global community.

3. RESEARCH METHODOLOGY

DOAR (Directory of Open Access Repositories)(http://www.opendoar.org) was browsed for the present paper. Total 997 institutional repositories are listed on DOAR from all over the country on different subjects. Out of 997, 48 Library and Information Science Institutional Repositories (LISIR) are selected for the paper. Analysis is presented on the basis of selected criteria like software used for repositories, size of the items, content included, languages, policies , description ,remarks and Country

4. SCOPE AND LIMITATION OF THE PAPER

Library and information Science Institutional Repositories are chosen based on the Directory of Open Institutional Repositories. Total 48 LISIR are analyzed based on the selected study criteria. Date of access the DOAR site is 26/11/07.

5. OBJECTIVES OF THE STUDY

- To know the LIS Institutional Repositories available on DOAR.
- To analyze the 48 LISIRs available on DOAR based on selected study criteria eg.
- software used for repositories,
- size of the items,
- content included,
- languages, policies ,

- description ,
- remarks
- Country
- To compile the web directory of LISIR.

6. ANALYSIS OF DATA AND INTERPRETATIONS

48 LISIR available on DOAR is analyzed based on selected study criteria i. e. software used for repositories, size of the items, content included, languages, policies, description, remarks and Country.

Table 1: Profile of the Organizations having Institutional Repositories

S.N.	Name of the Organizations	Abbreviation	Country	URL
1.	Advanced Knowledge Technologies	AKT	U.K.	http://eprints.aktors.org/perl/oai2
2.	Rijksuniversiteit Groningen,	RuG	Netherl ands	http://arts.eldoc.ub.rug.nl/oai/
3.	Australian Library and Information Association,	ALIA	Australia	http://e-prints.alia.org.au/perl/oai2
4.	(California Institute of Technology),	Caltech)	United States	http://caltechlib.library.caltech.edu/perl/oai2
5.	Consiglio Nazionale delle Ricerche	(CNR),	Italy	http://biblio-eprints.bo.cnr.it/perl/oai2
6.	Library & Information Service at Cranfield Campus, Cranfield University,	Cranfield QU	United Kingdom	http://dspace.lib.cranfield.ac.uk/dspace-oai/request
7.	Council on Library and Information Resources	CLIR	United States	—
8.	School of Information Resources & Library Science, University of Arizona (UA),	SIRLS	United States	http://dlist.sir.arizona.edu/perl/oai2
9.	Bromley College of Further & Higher Education,	BCFHE	United Kingdom	http://vle.bromley.ac.uk/dspace-oai/request
10.	ISTEC Executive Offices, Ibero American Science & Technology Education Consortium),	ISTEC	United States	http://dspace.istec.org/dspace-oai/request
11.	ICFAI Business School,	ICFAIBS	India	http://202.131.96.59:8080/dspace-oai/request/
12.	Library, London School of Economics and Political Science (LSE),	LSEPS	United Kingdom	http://gate-test.library.lse.ac.uk:8080/dspace-oai/request
13.	University of Namibia,	UN	Namibia	—
14.	Viikki Science Library, University of Helsinki,	VSL	Finland	http://www.tiedekirjasto.helsinki.fi/dspace-oai/request
15.	Advanced e-Publishing Infrastructures ,Consorzio Interuniversitario Lombardo per l'Elaborazione Automatica),	AePICCILEA	Italy	http://eprints.rclis.org/perl/oai2
16.	Electronic Resource Preservation and Access Network),	ERPANET	United Kingdom	http://eprints.erpanet.org/perl/oai2
17.	Lamar Soutter Library, University of Massachusetts Medical School (	UMASS	United States	http://escholarship.umassmed.edu/cgi/oai2.cgi
18.	Flinders University Library, Flinders University,	FUL	Australia, Germany	—
19.	Rechenzentrum Universität Freiburg, Albert-Ludwigs-Universität Freiburg	RUFALUF	United States	—
20.	Graduate School of Library and Information Science), University of Illinois at Urbana-Champaign,	GSLIS	France	—

S.N.	Name of the Organizations	Abbreviation	Country	URL
21.	Centre pour la Communication Scientifique Directe (CCSD),	CPCSD	France	http://hal.ccsd.cnrs.fr/oai/oai.php
22.	Centre pour la communication scientifique directe, France	CNRS -	Czech Republic	—
23.	Albertina icome Praha s.r.o.,	AIP	U.K.	—
24.	School of Informatics, University of Edinburgh,	SI	U.K.	—
25.	ilit.org, London Metropolitan University,	IL	Czech Republic	—
26.	Albertina icome Praha s.r.o.,	AIP	South Africa	—
27.	University of Pretoria - Academic Information Service,	AIS	France	—
28.	Ecole Normale Supérieure Lettres et Sciences Humaines,		India	http://eprints.ens-lsh.fr/perl/oai2
29.	Documentation Research and Training Centre, Indian Indian Statistical Institute, Bangalore	DRTC,ISI	France	http://library.isibang.ac.in:8080/dspace-oai/request
30.	Unité Régionale de Formation à l'Information Scientifique et Technique (Provence-Alpes-Côte d'Azur, Corse)), INIST- (Institut de l'Information Scientifique et Technique du CNRS	CNRSUrfist PaçaC	United States	http://memsic.ccsd.cnrs.fr/perl/oai2
31.	Online Computer Library Center	OCLC	India	—
32.	OneWorld South Asia Open Archive Initiative,	OWSA	United States	http://open.ekduniya.net/perl/oai2
33.	School of Information and Library Science, University of North Carolina	SILS, UNC),	Germany	http://www.open-video.org/oai2.0/
34.	University of Applied Sciences Wuerzburg, Schweinfurt	FHWS	Germany	http://www.opus-bayern.de/fh-wue-sw/oai/oai2.php
35.	Berufsverband Information Bibliothek e.V.	BIB	Norway	http://www.opus-bayern.de/bib-info/oai/oai2.php
36.	Computing Research, (Oslo University College),	CR,OUC	Canada	—
37.	Scholars Portal, (Ontario Council of University Libraries),	SP,OCUL	Canada	http://ozone.scholarsportal.info/oai/request
38.	Faculty of Education, University of British Columbia	FE,UBC	Netherlands	http://research2.csci.educ.ubc.ca/eprints/perl/oai2
39.	Rijksuniversiteit Groningen	RuG	(Mexico	http://bibliotheek.eldoc.ub.rug.nl/oai/
40.	Universidad de las Américas Puebla	UDLAP	Australia	http://ict.udlap.mx:9090/Tales/Oai_tesis
41.	Queensland University of Technology),	QUT	Brazil	http://eprints.qut.edu.au/perl/oai2
42.	Biblioteconomia e Ciência da Informação, Universidade Federal de Santa Catarina,		Brazil	http://www.bsf.tehospedo.com.br/ojs/oai/
43.	Rede de Informacao em Comunicacao dos Palses de Lingua Portuguesa, Intercom - Sociedade Brasileira de Estudos Interdisciplinares da Comunicação,	Intercom Portcom	United States	http://reposcom.portcom.intercom.org.br:8081/dspace-oai/request
44.	School of Information and Library Science, University of North Carolina	SILS,UNC	Canada	http://etd.ils.unc.edu/dspace-oai/request
45.	(Simon Fraser University Library), SFU (Simon Fraser University),	SFU Library	Finland	http://ir.lib.sfu.ca:8080/dspace-oai
46.	University of Tampere,	UT	U.K.	—
47.	University of Southampton (Soton),	US	United States	http://tprints.ecs.soton.ac.uk/perl/oai2/
48.	University of Tennessee,	UTe		http://oai.sunsite.utk.edu/cgi-bin/oai2.cgi

Table 2: Name of the LIS Institutional Repositories on DOAR

S.N.	Name of the Organizations	Name of Repositories
1	Advanced Knowledge Technologies	AKT EPrints Archive **(Advanced Knowledge Technologies EPrints Archive)**
2	Rijksuniversiteit Groningen,	ARTS repository - University of Groningen
3	Australian Library and Information Association,	ALIA e-prints **(Australian Library and Information Association e-prints)**
4	(California Institute of Technology),	Caltech Library System Papers and Publications **(CaltechLIB)**
5	Consiglio Nazionale delle Ricerche	CNR Bologna Research Library
6	Library & Information Service at Cranfield Campus, Cranfield University,	Cranfield QUEprints
7	Council on Library and Information Resources	Digital Library Federation Publications **(DLF Publications)**
8	School of Information Resources & Library Science, University of Arizona (UA),	Digital Library of Information Science & Technology **(dLIST)**
9	Bromley College of Further & Higher Education,	DSpace at Bromley College
10	ISTEC Executive Offices, Ibero American Science & Technology Education Consortium),	DSpace at Ibero American Science & Technology Education Consortium **(DSpace at ISTEC)**
11	ICFAI Business School,	DSpace at IBS Ahmedabad **(DSpace@IBSA)**
12	Library, London School of Economics and Political Science (LSE),	DSpace at the London School of Economics Library
13	University of Namibia,	DSpace at the University of Namibia Library
14	Viikki Science Library, University of Helsinki,	DViikki at University of Helsinki **(DViikki)**
15	Advanced e-Publishing Infrastructures ,Consorzio Interuniversitario Lombardo per l'Elaborazione Automatica),	E-LIS
16	Electronic Resource Preservation and Access Network),	Electronic Resource Preservation and Access Network ePRINTS Service **(ERPAePRINTS Service)**
17	Lamar Soutter Library, University of Massachusetts Medical School	eScholarship@UMMS
18	Flinders University Library, Flinders University,	FAC (Flinders Academic Commons)
19	Rechenzentrum Universität Freiburg, Albert-Ludwigs-Universität Freiburg	FREIMORE **(FREIburger Multimedia Object Repository)**
20	Graduate School of Library and Information Science), University of Illinois at Urbana-Champaign,	GSLIS Electronic Archives Project
21	Centre pour la Communication Scientifique Directe (CCSD),	HAL **(Hyper Article en Ligne)**
22	Centre pour la communication scientifique directe, France	Hyper Article en Ligne - Sciences de l'Homme et de la Société **(HAL- SHS)**
23	Albertina icome Praha s.r.o.,	INFORM Conference Proceedings
24	School of Informatics, University of Edinburgh,	Informatics@Edinburgh - Reports Series
25	ilit.org, London Metropolitan University,	Information Literacy Research
26	Albertina icome Praha s.r.o.,	INFORUM 2006 - Proceedings
27	University of Pretoria - Academic Information Service,	UPSpace **(Institutional Research Repository - University of Pretoria)**
28	Ecole Normale Supérieure Lettres et Sciences Humaines,	l'ENS Lettres et Sciences Humaines de Lyon
29	Documentation Research and Training Centre, Indian Statistical Institute, Bangalore Centre	Librarians' Digital Library **(LDL)**
30	Unité Régionale de Formation à l'Information Scientifique et Technique (Provence-Alpes-Côte d'Azur, Corse)), INIST- (Institut de l'Information Scientifique et Technique du CNRS	Mémoires en Sciences de l'Information et de la Communication **(mémSIC)**

S.N.	Name of the Organizations	Name of Repositories
31	(Online Computer Library Center),	OCLC Research Publications
32	OneWorld South Asia Open Archive Initiative, (OneWorld South Asia),	OneWorld South Asia Open Archive Initiative
33	School of Information and Library Science, University of North Carolina	Open Video Project
34	University of Applied Sciences Wuerzburg-Schweinfurt (FHWS),	OPUS-Datenbak Würzburg-Schweinfurt
35	Berufsverband Information Bibliothek e.V.	OPUS-Datenbank Berufsverband Information Bibliothek **(OPUS-Datenbank BIB)**
36	Computing Research, (Oslo University College),	PROJECT.iu.hio.no **(Oslo University College's PROJECT.iu.hio.no)**
37	Scholars Portal, (Ontario Council of University Libraries),	OZone **(OZone provided by Ontario Scholars Portal)**
38	Faculty of Education, University of British Columbia (UBC.ca),	Public Knowledge Project EPrint Archive
39	Rijksuniversiteit Groningen	Publicaties Bibliotheek RUG
40	Universidad de las Américas Puebla	Publications of the Interactive and Cooperative Technologies Lab
41	Queensland University of Technology),	Queensland University of Technology ePrints Archive **(QUT ePrints Archive)**
42	Biblioteconomia e Ciência da Informação, Universidade Federal de Santa Catarina,	Repositório Acadêmico de Biblioteconomia e Ciência da Informação
43	Rede de Informacao em Comunicacao dos Palses de Lingua Portuguesa, Intercom – Sociedade Brasileira de Estudos Interdisciplinares da Comunicação,	REPOSCOM **(Repositórios Institucionais em Ciências da Comunicação)**
44	School of Information and Library Science, University of North Carolina	SILS Electronic Theses & Dissertations **(SILS-ETD)**
45	Simon Fraser University Library	SFU Repository
46	University of Tampere,	Tampere University Dissertations
47	University of Southampton (Soton),	Ted Nelson's EPrint Archive
48	University of Tennessee,	University of Tennessee Sunsite Open Archives Initiative

Table 3: Software Used for LIS Institutional Repositories on DOAR

S.N.	Name of the organization	E-Prints	Wildfire	D-space	Bepress	Mycore	HAL	HTML	OAICAT	OPUS	Sunsite
1	AKT	✓	X	X	X	X	X	X	X	X	X
2	RuG	X	✓	X	X	X	X	X	X	X	X
3	ALIA	X	X	✓	X	X	X	X	X	X	X
4	Caltech	✓	X	X	X	X	X	X	X	X	X
5	(CNR),	✓	X	X	X	X	X	X	X	X	X
6	Cranfield QU	X	X	✓	X	X	X	X	X	X	X
7	CLIR	*	*	*	*	*	*	*	*	*	*
8	SIRLS	✓	X	X	X	X	X	X	X	X	X
9	BCFHE	X	X	✓	X	X	X	X	X	X	X
10	(ISTEC	X	X	✓	X	X	X	X	X	X	X
11	ICFAIBS	X	X	✓	X	X	X	X	X	X	X
12	LSEPS	X	X	✓	X	X	X	X	X	X	X
13	UN	X	X	✓	X	X	X	X	X	X	X
14	VSL	X	X	✓	X	X	X	X	X	X	X
15	AePICCILEA	✓	X	X	X	X	X	X	X	X	X
16	ERPANET	✓	X	X	X	X	X	X	X	X	X
17	UMASS	X	X	X	✓	X	X	X	X	X	X
18	FUL	X	X	✓	X	X	X	X	X	X	X
19	RUFALUF	X	X	X	X	✓	X	X	X	X	X
20	GSLIS	*	*	*	*	*	*	*	*	*	*
21	CPCSD	X	X	X	X	X	✓	X	X	X	X
22	CNRS -	*	*	*	*	*	*	*	*	*	*
23	AIP	*	*	*	*	*	*	*	*	*	*
24	SI	X	X	X	X	X	X	✓	X	X	X
25	IL	*	*	*	*	*	*	*	*	*	*
26	AIP	X	X	X	X	X	X	✓	X	X	X
27	AIS	X	X	✓	X	X	X	X	X	X	X
28	ENSLSH	✓	X	X	X	X	X	X	X	X	X
29	DRTC,ISI	X	X	✓	X	X	X	X	X	X	X
30	CNRSUrfist PacaC	✓	X	X	X	X	X	X	X	X	X
31	OCLC	X	X	X	X	X	X	X	✓	X	X
32	OWSA	✓	X	X	X	X	X	X	X	X	X
33	SILS, UNC),	*	*	*	*	*	*	*	*	*	*
34	FHWS	X	X	X	X	X	X	X	X	✓	X
35	(BIB),	X	X	X	X	X	X	X	X	✓	X
36	CR,OUC	*	*	*	*	*	*	*	*	*	*
37	SP,OCUL	X	X	✓	X	X	X	X	X	X	X
38	FE,UBC	✓	X	X	X	X	X	X	X	X	X
39	(RuG),	X	✓	X	X	X	X	X	X	X	X
40	UDLAP),	*	*	*	*	*	*	*	*	*	*
41	(QUT	✓	X	X	X	X	X	X	X	X	X
42	BCI	*	*	*	*	*	*	*	*	*	*
43	Intercom Portcom	X	X	✓	X	X	X	X	X	X	X
44	SILS,UNC),	X	X	✓	X	X	X	X	X	X	X
45	SFU Library	X	X	✓	X	X	X	X	X	X	X
46	UT	*	*	*	*	*	*	*	*	*	*
47	US	✓	X	X	X	X	X	X	X	X	X
48	UTe	X	X	X	X	X	X	X	X	X	✓

*shows the information not given

Table 3a: Analysis of Software Used for LIS Institutional Repositories

S.N.	Name of the Software	No. of Organizations
1	E-Prints	12
2	Wildfire	01
3	D-space	15
4	Bepress	01
5	Mycore	01
6	HAL	01
7	HTML	03
8	OAICAT	01
9	OPUS	02
10	Sunsite	01
	Total	38
	Software information not given	10

Table 3a shows the software used for LIS Institutional Repositories on DOAR. D-Space software is used by 15 LISIR followed by E-prints software which is used by 12 LISIR. Wildfire, Beprees, MyCoRe, HAL, OAICAT and Sunsite software is used by 1 LISIR respectively. Out of 48 LISIR , 38 LIS Institutional Repositories information is provided on DOAR. On 10 LISIR, software information is not included on DOAR. It is observed that D-Space and E-Prints software are most common software used for institutional repositories.

Table 4: Items included in LISIR on DOAR

S.N. included	*Name of the IR*	*No. of Items*
1	AKT EPrints Archive **(Advanced Knowledge Technologies EPrints Archive)**	341(27/7/07)
2	ARTS repository - University of Groningen	
3	ALIA e-prints **(Australian Library and Information Association e-prints)**	97(15/2/07)
4	Caltech Library System Papers and Publications **(CaltechLIB)**	40(7/8/07)
5	CNR Bologna Research Library	58(7/8/07)
6	Cranfield QUEprints	1709(18/10/07)
7	Digital Library Federation Publications **(DLF Publications)**	46(31/10/07)
8	Digital Library of Information Science & Technology **(dLIST)**	693(06/11/07)
9	DSpace at Bromley College	31(08/08/06)
10	DSpace at Ibero American Science & Technology Education Consortium **(DSpace at ISTEC)**	24(23/04/07)
11	DSpace at IBS Ahmedabad **(DSpace@IBSA)**	171(25/06/07)
12	DSpace at the London School of Economics Library	129(22/08/07)
13	DSpace at the University of Namibia Library	—
14	DViikki at University of Helsinki **(DViikki)**	3559(27/07/07)
15	E-LIS	5824(12/06/07)
16	Electronic Resource Preservation and Access Network ePRINTS Service **(ERPAePRINTS Service)**	51(15/08/06)
17	eScholarship@UMMS	156(17/08/06)
18	FAC **(Flinders Academic Commons)**	1022(11/09/06)
19	FREIMORE **(FREIburger Multimedia Object Repository)**	—
20	GSLIS Electronic Archives Project	9(31/08/06)

21	HAL (Hyper Article en Ligne)	-
22	Hyper Article en Ligne - Sciences de l'Homme et de la Société (HAL- SHS)	8268(17/07/06)
23	INFORM Conference Proceedings	-
24	Informatics@Edinburgh - Reports Series	860(04/10/06)
25	Information Literacy Research	9(13/11/06)
26	INFORUM 2006 - Proceedings	80(08/11/06)
27	UPSpace (Institutional Research Repository - University of Pretoria)	2390(17/10/07)
28	l'ENS Lettres et Sciences Humaines de Lyon	121(23/04/07)
29	Librarians' Digital Library (LDL)	249(17/08/06)
30	Mémoires en Sciences de l'Information et de la Communication (mémSIC)	119(14/06/07)
31	OCLC Research Publications	303(29/09/06)
32	OneWorld South Asia Open Archive Initiative	75(15/08/06)
33	Open Video Project	3967(29/09/06)
34	OPUS-Datenbak Würzburg-Schweinfurt	16(17/08/06)
35	OPUS-Datenbank Berufsverband Information Bibliothek (OPUS-Datenbank BIB)	208(17/08/06)
36	PROJECT.iu.hio.no (Oslo University College's PROJECT.iu.hio.no)	20(04/11/06)
37	OZone (OZone provided by Ontario Scholars Portal)	32(29/09/06)
38	Public Knowledge Project EPrint Archive	48(17/08/06)
39	Publicaties Bibliotheek RUG	28(16/08/06)
40	Publications of the Interactive and Cooperative Technologies Lab	76(16/08/06)
41	Queensland University of Technology ePrints Archive (QUT ePrints Archive)	3543(18/08/06)
42	Repositório Acadêmico de Biblioteconomia e Ciência da Informação	33(18/08/06)
43	REPOSCOM (Repositórios Institucionais em Ciências da Comunicação)	9154(21/08/06)
44	SILS Electronic Theses & Dissertations (SILS-ETD)	292(18/08/06)
45	SFU Repository	872(15/08/06)
46	Tampere University Dissertations	833(17/07/07)
47	Ted Nelson's EPrint Archive	31(17/08/06)
48	University of Tennessee Sunsite Open Archives Initiative	1089(18/08/06)

Table 4a: Analysis of Items included in LIS Institutional Repositories

S.N.	Range of Items	No. of IR
1	1-1000	33
2	1000-2000	03
3	2000-3000	01
4	3000-4000	03
5	4000-5000	-
6	5000-6000	01
7	6000-7000	-
8	7000-8000	-
9	8000-9000	01
10	9000-10000	01

Item included in LISIR on DOAR has been shown in Table 4 and analysis is presented in Table 4a. Maximum numbers of items (9154) are posted by REPOSCOM Institutional repositories followed by HAL-SHS (8268 items). Minimum numbers of items (9) are posted by GSLIS followed by D-

Space at ISTEC (24 items). 33 LISIR comes under in the range of1-1000 items posted on institutional repositories. Out of 48 LISIR, 45 institutional Repositories given the items information on DOAR and 3 LISIR are not provided the number of items included in Institutional Repositories.

Table 5: Contents of LISIR on DOAR

S.N.	Name of the IR	Contents included												
		Publi-cations	Confe-rences	Unpub-lished	Books	Post prints	Thesis	Spe-cial	Learning Objects	Multi-media	Pre-print	Refe-rence	Data Set	Patents
1	AKT EPrints Archive	✓	✓	✓	✓	X	X	X	X	X	X	X	X	X
2	ARTS repository													
3	ALIA e-prints)	X	✓	X	X	X	X	X	X	X	X	X	X	X
4	**CaltechLIB**	✓	✓	✓	✓	X	X	X	X	X	X	X	X	X
5	CNR Bologna Research Library	✓	✓	✓	X	X	✓	X	X	X	✓	X	X	X
6	Cranfield QUEprints	✓	X	✓	X	X	✓	✓	X	X	✓	X	X	X
7	**DLF Publications**	X	X	✓	X	✓	X	X	X	X	X	X	X	X
8	**dLIST**	✓	✓	✓	✓	X	✓	✓	X	X	✓	X	X	X
9	DSpace at Bromley College	X	X	X	X	X	X	X	✓	✓	X	X	X	X
10	**(DSpace at ISTEC)**	X	✓	✓	X	X	X	X	X	X	✓	X	X	X
11	DSpace at IBS Ahmedabad **(DSpace@IBSA)**	X	✓	✓	✓	✓	X	✓	X	X	X	X	X	X
12	DSpace at the London School of Economics Library	✓	✓	✓	X	X	X	X	X	X	X	X	X	X
13	DSpace at the University of Namibia Library	X	✓	✓	X	X	X	X	X	X	X	X	X	X
14	**(DViikki)**	✓	✓	X	X	X	X	X	X	X	X	X	X	X
15	E-LIS	✓	✓	✓	✓	X	✓	✓	✓	X	X	✓	✓	X
16	**ERPAePRINTS Service)**	✓	✓	✓	X	X	✓	X	X	X	✓	X	X	X
17	eScholarship@UMMS	X	X	X	✓	✓	✓	X	X	X	X	✓	X	X
18	FAC	✓	X	✓	X	X	X	X	X	X	X	X	X	X
19	FREIMORE	X	X	✓	✓	✓	✓	X	✓	X	X	✓	X	X
20	GSLIS Electronic Archives Project	X	✓	X	X	✓	X	X	X	✓	X	X	X	X
21	HAL	✓	✓	X	✓	X	✓	X	X	X	✓	X	X	X
22	**HAL- SHS**	✓	✓	✓	✓	X	✓	X	X	X	✓	X	X	X
23	INFORM Conference Proceedings	X	✓	X	X	X	X	X	X	X	X	X	X	X
24	Informatics@Edinburgh - Reports Series	X	X	✓	X	X	X	✓	X	X	X	✓	X	X
25	Information Literacy Research	X	✓	X	X	✓	X	X	X	✓	X	X	X	X
26	INFORUM 2006 - Proceedings	X	✓	X	X	X	X	X	X	X	X	X	X	X

27	UPSpace	X	✓	X	X	✓	X	X	X	✓	X	X	X	X
28	l'ENS Lettres et Sciences Humaines de Lyon	✓	X	X	✓	X	X	X	X	X	X	✓	X	X
29	Librarians' Digital Library (LDL)	✓	✓	X	X	X	✓	X	X	✓	X	X	X	X
30	**mémSIC**	X	X	X	X	✓	✓	X	X	X	X	X	X	X
31	OCLC Research Publications	✓	✓	✓	X	X	X	X	X	X	X	✓	X	X
32	OneWorld South Asia Open Archive Initiative	✓	✓	✓	✓	X	✓	X	X	X	X	X	X	✓
33	Open Video Project	X	✓	✓	X	✓	✓	X	X	✓	X	X	X	X
34	OPUS-Datenbak Würzburg-Schweinfurt	X	X	✓	X	X	✓	X	X	X	X	X	X	X
35	**OPUS-Datenbank BIB**	X	✓	✓	X	X	X	X	X	X	X	X	X	X
36	PROJECT.iu.hio.no	X	X	X	X	✓	✓	X	✓	X	X	X	X	X
37	OZone	✓	X	✓	X	X	X	X	✓	X	X	X	✓	X
38	Public Knowledge Project EPrint Archive	✓	✓	X	✓	X	✓	X	X	X	X	X	X	X
39	Publicaties Bibliotheek RUG	X	X	X	X	✓	X	X	X	X	X	X	X	X
40	Publications of the Interactive and Cooperative Technologies Lab	✓	X	✓	X	X	X	X	X	X	X	✓	X	X
41	**(QUT ePrints Archive)**	✓	✓	✓	X	✓	X	X	X	X	X	X	X	X
42	Repositório Acadêmico de Biblioteconomia e Ciência da Informação	✓	✓	✓	X	X	X	X	X	X	X	X	X	X
43	REPOSCOM	X	✓	X	✓	✓	✓	X	X	X	X	X	X	X
44	**SILS-ETD)**	X	X	X	X	X	✓	X	X	X	X	X	X	X
45	SFU Repository	✓	✓	✓	X	X	X	X	X	X	X	X	✓	X
46	Tampere University Dissertations	X	X	X	X	X	X	X	X	X	X	X	X	X
47	Ted Nelson's EPrint Archive	X	✓	X	X	✓	X	X	X	X	X	X	X	X
48	University of Tennessee Sunsite Open Archives Initiative	X	X	✓	X	X	✓	✓	X	✓	X	✓	✓	

Table 5a: Analysis of Contents included in LIS Institutional Repositories

S.N.	*Contents*	*No. of IR*
1	Publications	22
2	Conferences	30
3	Unpublished Material	27
4	Books	13
5	Post prints	13
6	Theses	22
7	Special	06
8	Learning Objects	05
9	Multimedia	07
10	References	08
11	Preprints	07
12	Datasets	04
13	Patents	01

Table 5a shows the type of contents included in LIS institutional Repositories. Out of 48 LISIR 22 repositories included the journal publications. Most of the (30) LISIR posted the conferences articles. 27 LISIR posted the unpublished materials on their institutional repositories. Theses content is posted by 22 LISIR. Only 1 LISIR i.e. One world South Asia Open Archive Initiative posted Patents on Institutional Repository. E-LIS repository posted maximum number of contents i.e. Publications in Journals, Conferences, unpublished materials, Books, Theses, Special Material, Learning Objects, Reference, and Datasets followed by dLIST.

Table 6: Languages included in LISIR on DOAR

S.N.	*Name of the IR*	*Languages*								
		English	*Dutch*	*Spanish*	*Finnish*	*Italian*	*French*	*German*	*Portuguese*	*Total*
1	AKT EPrints Archive	✓	X	X	X	X	X	X	X	X
2	ARTS repository	✓	X	X	X	X	X	X	X	X
3	ALIA e-prints)	✓	X	X	X	X	X	X	X	X
4	CaltechLIB	✓	X	X	X	X	X	X	X	X
5	CNR Bologna Research Library	✓	X	X	X	✓	X	X	X	X
6	Cranfield QUEprints	✓	X	X	X	X	X	X	X	X
7	DLF Publications	✓	X	X	X	X	X	X	X	X
8	dLIST	✓	X	X	X	X	X	X	X	X
9	DSpace at Bromley College	✓	X	X	X	X	X	X	X	X
10	(DSpace at ISTEC)	✓	X	✓	X	X	X	X	X	X
11	DSpace at IBS Ahmedabad (DSpace@IBSA)	✓	X	X	X	X	X	X	X	X
12	DSpace at the London School of Economics Library	✓	X	X	X	X	X	X	X	X
13	DSpace at the University of Namibia Library	✓	X	X	X	X	X	X	X	X
14	(DViikki)	✓	X	X	✓	X	X	X	X	X
15	E-LIS	✓	X	✓	X	✓	X	X	X	X

16	**ERPAePRINTS Service)**	✓	X	X	X	X	X	X	X	X
17	eScholarship@UMMS	✓	X	X	X	X	X	X	X	X
18	FAC	✓	X	X	X	X	X	X	X	X
19	FREIMORE	X	X	X	X	X	X	✓	X	X
20	GSLIS Electronic Archives Project	✓	X	X	X	X	X	X	X	X
21	HAL	X	X	X	X	X	✓	X	X	X
22	**HAL- SHS**	X	X	X	X	X	✓	X	X	X
23	INFORM Conference Proceedings	✓	X	X	X	X	X	X	X	X
24	Informatics@Edinburgh - Reports Series	✓	X	X	X	X	X	X	X	X
25	Information Literacy Research	✓	X	X	X	X	X	X	X	X
26	INFORUM 2006 - Proceedings	✓	X	X	X	X	X	X	X	X
27	UPSpace	✓	X	X	X	X	X	X	X	X
28	l'ENS Lettres et Sciences Humaines de Lyon	✓	X	X	X	X	✓	X	X	X
29	Librarians' Digital Library **(LDL)**	✓	X	X	X	X	X	X	X	X
30	**mémSIC**	✓	X	X	X	X	✓	X	X	X
31	OCLC Research Publications	✓	X	X	X	X	X	X	X	X
32	OneWorld South Asia Open Archive Initiative	✓	X	X	X	X	X	X	X	X
33	Open Video Project	✓	X	X	X	X	X	X	X	X
34	OPUS-Datenbak Würzburg-Schweinfurt	✓	X	X	X	X	X	X	X	X
35	**OPUS-Datenbank BIB**	✓	X	X	X	X	X	✓	X	X
36	PROJECT.iu.hio.no	✓	X	X	X	X	X	✓	X	X
37	OZone	✓	X	X	X	X	X	X	X	X
38	Public Knowledge Project EPrint Archive	✓	X	X	X	X	X	X	X	X
39	Publicaties Bibliotheek RUG	✓	✓	X	X	X	X	X	X	X
40	Publications of the Interactive and Cooperative Technologies Lab	✓	X	✓	X	X	X	X	X	X
41	**(QUT ePrints Archive)**	✓	X	X	X	X	X	X	X	X
42	Repositório Acadêmico de Biblioteconomia e Ciência da Informação	X	X	X	X	X	X	X	✓	X
43	REPOSCOM	✓	X	X	X	X	X	X	✓	X
44	**SILS-ETD)**	✓	X	X	X	X	X	X	X	X
45	SFU Repository	✓	X	X	X	X	X	X	X	X
46	Tampere University Dissertations	✓	X	X	✓	X	X	✓	X	X
47	Ted Nelson's EPrint Archive	✓	X	X	X	X	X	X	X	X
48	University of Tennessee Sunsite Open Archives Initiative	✓	X	X	X	X	X	X	X	X

Table 6a: Analysis of Languages included in LISIR on DOAR

S.N.	*Languages Included*	*No. of LISIR*
1	English	41
2	Dutch	02
3	Spanish	03
4	Finnish	02
5	Italian	02
6	French	04
7	German	04
8	Portuguese	02
9	Hindi	01
10	Kanada	01

Languages play a vital role in communication of information. Table 6a shows the languages included in LISIR on DOAR. It is observed from the above table that English language is used by 41 LISIR followed by Spanish language. Only LDL repository posted the Hindi documents. E-LIS repository uses three languages English, Spanish and Italian.

Table 7: Policies Included in LISIR on DOAR

S.N.	Name of the IR	Policies				
		Metadata Reuse policy	Full Data item policy	Content policy	Preservation policy	Submission policy
1	AKT EPrints Archive	UD	UD	UD	NS	UD
2	ARTS repository	UD	UD	UD	NS	D
3	ALIA e-prints)	UD	UD	UD	NS	UD
4	CaltechLIB	P	RP	UD	D	D
5	CNR Bologna Research Library	P	P	D	D	D
6	Cranfield QUEprints	UD	UD	UD	NS	UD
7	DLF Publications	UD	UD	UD	NS	UD
8	dLIST	P	RP	UD	D	D
9	DSpace at Bromley College	UD	UD	UD	NS	UD
10	(DSpace at ISTEC)	UD	UD	UD	NS	UD
11	DSpace at IBS Ahmedabad (DSpace@IBSA)	UD	UD	UD	NS	UD
12	DSpace at the London School of Economics Library	UD	UD	UD	NS	UD
13	DSpace at the University of Namibia Library	UD	UD	UD	NS	UD
14	(DViikki)	UD	UD	UD	NS	D
15	E-LIS	CP	RP	D	D	D
16	ERPAePRINTS Service)	P	P	UD	NS	D
17	eScholarship@UMMS	UD	UD	UD	NS	UD
18	FAC	UD	UD	UD	NS	UD
19	FREIMORE	UD	UD	UD	NS	UD
20	GSLIS Electronic Archives Project	UD	UD	UD	NS	UD
21	HAL	UD	UD	UD	NS	UD
22	HAL- SHS	UD	UD	UD	NS	UD

23	INFORM Conference Proceedings	UD	UD	UD	NS	UD
24	Informatics@Edinburgh - Reports Series	UD	UD	UD	NS	UD
25	Information Literacy Research	UD	UD	UD	NS	UD
26	INFORUM 2006 - Proceedings	UD	UD	UD	NS	UD
27	UPSpace	UD	UD	UD	NS	UD
28	l'ENS Lettres et Sciences Humaines de Lyon	UD	UD	UD	NS	UD
29	Librarians' Digital Library (LDL)	UD	UD	UD	NS	UD
30	mémSIC	P	P	UD	NS	D
31	OCLC Research Publications	UD	UD	UD	NS	UD
32	OneWorld South Asia Open Archive Initiative	UD	UD	UD	NS	UD
33	Open Video Project	UD	UD	UD	NS	UD
34	OPUS-Datenbak Würzburg-Schweinfurt	UD	UD	UD	NS	UD
35	OPUS-Datenbank BIB	UD	UD	UD	NS	UD
36	PROJECT.iu.hio.no	UD	UD	UD	NS	UD
37	OZone	UD	UD	UD	NS	UD
38	Public Knowledge Project EPrint Archive	UD	UD	UD	NS	UD
39	Publicaties Bibliotheek RUG	UD	UD	UD	NS	UD
40	Publications of the Interactive and Cooperative Technologies Lab	UD	UD	UD	NS	UD
41	(QUT ePrints Archive)	P	RP	D	NS	D
42	Repositório Acadêmico de Biblioteconomia e Ciência da Informação	UD	UD	UD	NS	UD
43	REPOSCOM	UD	UD	UD	NS	UD
44	SILS-ETD)	UD	UD	UD	NS	UD
45	SFU Repository	UD	UD	UD	D	D
46	Tampére University Dissertations	UD	UD	UD	NS	UD
47	Ted Nelson's EPrint Archive	UD	UD	UD	NS	UD
48	University of Tennessee Sunsite Open Archives Initiative	CP	P	UD	NS	UD

Note : Undefined = UD , Defined = D , Not Stated = NS , Permitted for Non-profit org = P, Commercial Purpose = CP

Table 7a: Analysis of Policies Included in LISIR on DOAR

S.N.	*Policies Used*	*No. of LISIR*
1	Metadata Re-use Permitted for not-For profit purpose	6
2	Metadata re-use policy undefined	40
3	Commercial Metadata re-use permitted	3
4	Full data Item policy undefined	39
5	Full data item policy Permitted	4
6	Harvesting full data items by robots prohibited	6
5	Content Policy defined	4
6	Content Policy undefined	44
7	Preservation Policy defined	5
8	Preservation Policy not stated	43
9	Submission Policy defined	10
10	Submission Policy undefined	38

Table 7a shows the analysis of policies of LISIR on DOAR. Metadata re-use is permitted for non-profit purpose by 6 LISIR. 40 LIS Institutional Repositories metadata re-use policy are undefined. Full data item policy is undefined by 39 LISIR. Only on 4 LISIR full data item policy is permitted for non- profit purpose. 3 LISIR metadata re-use is permitted for commercial purpose. Content policy is defined by only 4 LISIR and undefined by 44 LISIR. Preservation policy is defined by 5 LISIR and not stated by 43 LISIR. Submission Policy is defined by 10 LISIR and undefined by 38 LISIR.

Table 8: LISIR on DOAR by Continent

S.N.	*Continent*	*No. of LISIR*	*Rank*
1	United States	10	1
2	United Kingdom	8	2
3	India	4	3
4	Italy	2	5
5	Australia	3	4
6	France	4	3
7	Germany	3	4
8	Canada	2	5
9	Norway	1	6
10	Netherlands	2	5
11	Brazil	2	5
12	Finland	2	5
13	Namibia	1	6
14	Czech Republic	2	5
15	South Africa	1	6
16	Mexico	1	6
	Total	48	

Table 8 shows the LISIR on DOAR by continent. United States is in the 1st Rank who has posted 10 LIS institutional repositories followed by U.K. (8 repositories). India has posted 4 LISIR repositories. Norway, Namibia, South Africa and Mexico has posted only 1 LIS repository.

Table 9: Interdisciplinary Subjects Listed In LISIR DOAR

S.No	*Name of IR*	*Interdisciplinary Subjects*							
		LIS	*Education*	*Computer & IT*	*Health & Medicine*	*Business*	*Science*	*Social Science*	*Manage-ment*
1	AKT EPrints Archive	✓	X	✓	X	X	X	X	X
2	ARTS repository	✓	X	X	X	X	X	✓	X
3	ALIA e-prints	✓	✓	✓	X	X	X	✓	X
4	**CaltechLIB**	✓	X	X	X	X	X	X	X
5	CNR Bologna Research Library	✓	X	X	X	X	X	X	X
6	Cranfield QUEprints	✓	X	✓	X	✓	X	X	X
7	**DLF Publications**	✓	X	✓	X	X	X	X	X
8	**dLIST**	✓	X	✓	X	X	X	✓	X
9	DSpace at Bromley College	✓	✓	✓	X	X	X	X	X
10	**(DSpace at ISTEC)**	✓		✓	X	X	✓	X	X

11	DSpace at IBS Ahmedabad (DSpace@IBSA)	✓	X	X	X	✓	✓	X	✓
12	DSpace at the London School of Economics Library	✓	X	X	X	X	X	X	X
13	DSpace at the University of Namibia Library	✓	X	X	X	X	X	X	X
14	(DViikki)	✓	X	X	✓	X	✓	X	X
15	E-LIS	✓	X	X	X	X	X	X	X
16	ERPAePRINTS Service)	✓	X	✓	X	X	X	X	X
17	eScholarship@UMMS	✓	X	X	✓	X	X	X	X
18	FAC	✓	X	X	X	X	X	✓	X
19	FREIMORE	✓	X	✓	✓	X	X	X	X
20	GSLIS Electronic Archives Project	✓	X	✓	X	X	X	X	X
21	HAL	✓	✓	✓	✓	✓	✓	✓	✓
22	HAL- SHS	✓	✓	✓	✓	✓	✓	✓	✓
23	INFORM Conference Proceedings	✓	X	X	X	X	X	X	X
24	Informatics@Edinburgh - Reports Series	✓	X	✓	X	X	X	X	X
25	Information Literacy Research	✓	X	X	X	X	X	X	X
26	INFORUM 2006 - Proceedings	✓	X	X	X	X	X	X	X
27	UPSpace	✓	✓	X	✓	X	✓	✓	X
28	l'ENS Lettres et Sciences Humaines de Lyon	✓	X	X	X	X	✓	✓	X
29	Librarians' Digital Library (LDL)	✓	X	X	X	X	X	X	X
30	mémSIC	✓	X	✓	X	X	X	X	X
31	OCLC Research Publications	✓	X	X	X	X	X	X	X
32	OneWorld South Asia Open Archive Initiative	✓	X	✓	X	X	X	X	X
33	Open Video Project	✓	X	X	X	X	✓	X	X
34	OPUS-Datenbak Würzburg-Schweinfurt	✓	X	X	X	✓	✓	✓	X
35	OPUS-Datenbank BIB	✓	X	X	X	X	X	X	X
36	PROJECT.iu.hio.no	✓	X	✓	X	X	X	X	X
37	OZone	✓	X	X	X	X	X	X	X
38	Public Knowledge Project EPrint Archive	✓	✓	X	X	X	X	X	X
39	Publicaties Bibliotheek RUG	✓	X	X	X	X	✓	✓	X
40	Publications of the Interactive and Cooperative Technologies Lab	✓	X	✓	X	X	X	X	X
41	(QUT ePrints Archive)	✓	✓	✓	✓	✓	✓	✓	✓
42	Repositório Acadêmico de Biblioteconomia e Ciência da Informação	✓	X	X	X	X	X	X	X
43	REPOSCOM	✓	X	X	X	X	X	✓	X
44	SILS-ETD)	✓	X	X	X	X	X	X	X
45	SFU Repository	✓	X	X	✓	X	X	✓	X
46	Tampere University Dissertations	✓	X	X	✓	✓	X	✓	X
47	Ted Nelson's EPrint Archive	✓	X	✓	X	X	X	X	X
48	University of Tennessee Sunsite Open Archives Initiative	✓	X	X	X	X	X	✓	X

Table 9a: Analysis of Interdisciplinary Subjects Listed In LISIR DOAR

S.N.	*Subjects*	*Total No.*
1	LIS	48
2	Education	07
3	Computer and IT	19
4	Health and Medicine	09
5	Business & Economics	07
6	Science	11
7	Social- Science	15
8	Management	04

Table 9a shows the analysis of Interdisciplinary subjects listed in LISIR on DOAR. On 48 LISIR also covers the other interdisciplinary subjects like education, computer, IT, Health and Medicine, Business and Economics, science, social-science and Management. HAL, HAL-SHS and QUT eprints Archive posted their institutional repositories on LIS, education, computer and IT, Health and Medicine, Business and Economics , science, Social-science and Management.

7. FINDINGS

- It is observed that D-Space and E-Prints software is most common software used for institutional repositories.(Table No. 3)
- Maximum numbers of items (9154) are posted by REPOSCOM institutional repositories followed by HAL-SHS (8268 items). (Table No. 4.a)
- 33 LISIRs comes under in the range of 1-1000 items posted on institutional repositories. (Table No. 4.a)
- Out of 48 LISIR, 22 repositories included the publications in journals, Only 1 LISIR i.e. One World South Asia Open Archive Initiative posted Patent on Institutional Repository. E-LIS repositories posted maximum number of contents i.e. Publications in Journals, Conferences, unpublished materials, Books, Theses, Special Material, Learning Objects, Reference, and Datasets followed by dLIST. (Table No. 5.a)
- It is observed that English language is used by 41 LISIR followed by Spanish language. E-LIS repository uses three languages English, Spanish and Italian.(Table No. 6.a)
- Metadata re-use is permitted for non-profit purpose by 6 LISIR.(Table No. 7)
- United States is in the 1st Rank who has posted 10 LIS institutional repositories followed by U.K. (8 repositories). India has posted 4 LISIR repositories. (Table No. 8).
- HAL, HAL-SHS and QUT E-prints Archive posted their institutional repositories on LIS, education, computer and IT, Health and Medicine, Business and Economics , science, Social-science and Management. (Table No. 9)

8. CONCLUSION

Institutional repositories are now clearly and broadly being recognized as essential infrastructure in the digital world. At present there is no single comprehensive and authoritative list which records academic open access repositories. In a networked environment, Information Discovery and Retrieval

are the keys to the successful delivery of services. By listing archives and their descriptions, *Open*DOAR will support third party service providers.

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Enhancing The Impact Of Indian Scholarly Communication Through Institutional Repositories

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1. INTRODUCTION

India has prospered through its strong academic and research establishments. The R&D organizations have also developed expertise in their respective areas that are now recognized worldwide. Leading Indian scientific research institutions, such as Indian Institute of Science (IISC), Indian Institutes of Technology (IITs), Indian Statistical Institute (ISI), laboratories under the Council of Scientific and Industrial Research (CSIR), Indian Council of Medical Research (ICMR), Indian Council Agricultural Research (ICAR), Indian Space Research Organisation (ISRO), Department of Atomic Energy (DAE), traditional universities, deemed universities and Corporate R & Ds have been playing crucial role towards national development. The high quality research accompanied by innumerable scholarly communications to various national and internationals journals and conferences has put India in the forefront in the developing world and leader of South Asian countries. Only the elite institutions have reasonably good information provision facilities that support scholarly communications. On one hand the paucity of funds for the subscription based scholarly journals and on the other the shrinking budget discourage both the access to vast scholarly publications and publication process itself. The open access literature plays a vital role, both in terms of research communication and access, provided, of course, the benefits in terms of economic and social recognitions are assured by this system. While the ICT infrastructure necessary to take advantage of the open access is not adequate in developing countries, the situation in India, is the other way round. The situation has improved to a considerable extent. The number of Internet subscribers in was 140,000 in 1998 and now the number has crossed 5 million. There is a big leap in the telecommunication facility and Internet bandwidth available.

Although it is now possible to have free access to exhaustive information on the web, still significant amount of research is not available freely. While the delivery technique for scientific publications has changed rapidly, the economic ramifications have hardly changed. The open access movement was triggered by the journal crisis due to exorbitant price increase of the publications. During the 1990s several e-print archives as well as a few hundred peer-reviewed, electronic, scholarly journals emerged. The common denominator for most of these is that they offer free access to the electronic product. This has become known as "open access publishing".

2. OPEN ACCESS MOVEMENT

Open access may be defined as a philosophy to achieve the goal of accessing and making available the digital material free of charge, which may or may not be free from copyright and licensing restrictions. 'Open access' (OA) means that a reader of a scientific publication can read it over the

Internet, print it out and even further distribute it for non-commercial purposes without any payments or restrictions. At the most the reader is in some cases required to register with the service in question, which for instance can be useful for the service providers in view of the production of readership statistics. The use of the content by third parties for commercial purposes is, however, as a rule prohibited. Thanks to the open availability the linking from reference lists to OA publications is substantially facilitated, since the reader does not encounter barriers such as use licenses, and each reference is only a mouse-click away. In general, the author keeps almost complete copyright and can also publish the material elsewhere. The concept of OA came into existence sometime in 1991 due to the necessity of facilitating scholarly communication. According to **Berlin Declaration** act "open access is a comprehensive source of human knowledge and cultural heritage approved by the scientific community". **Budapest Initiative** defines Open access as 'freely available on Internet for the public, permitting to read, download, copy, distribute, print, search or link to the full text, 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'.

'Bangalore Commitment' (November 2006): a commitment to mandate Open Access self-archiving in their own respective countries and thereby set an example for emulation by the rest of the world: '*Self-archive unto others as you would have others self-archive unto you*'.

Recently a group of young professionals has formed a Registered Society known as Open Knowledge Society (*http://www.oksociety.org*) under The Travancore Cochin Literary, Scientific and Charitable Societies Registration Act, 1955. This 'OKSociety' aims to promote Open Access in India through creating awareness and organizing training programmes and would act as a forum to provide support services through an array of volunteers.

3. OPEN ACCESS CHANNELS

The four most important OA channels are – refereed free electronic journals, research-area-specific archive (e-print) servers, institutional repositories (IRs) of individual universities/institutions and self-posting on authors' home pages.

3.1 Open Access Journals

Open access journals are e-journals that are freely available (some open access journals have supplementary fee-based print versions as well). Open access journals provide access to full-text contents of scholarly, peer-reviewed journals. There are two types of open access journals - the one, available in electronic version only and the other, available in both electronic as well as print versions viz., Current Science. In the first type, the journals are published in regular intervals on the Internet that do not have any print-on-paper counterpart. In the second type, the journals are published in print-on-paper format and distributed to the subscribers. The same contents of print-on-paper are available to the scholars free of charge in electronic form. OA journals perform peer review and then make the approved contents freely available worldwide. Some OA journal publishers are non-profit (e.g. Public Library of Science or PLoS) and some are for-profit (e.g. BioMed Central or BMC).

There is a healthy sign of adopting the open access much faster in India compared to many developing countries. A good number of high quality, peer-reviewed open access journals are being published covering a wide spectrum of subjects. While there are many publishers in this category, six major publishers need special mention. They are - Indian Academy of Sciences (IAS, 11 journals);

Indian National Science Academy (INSA, 4 journals); Indian Medlars Center of NIC (MedInd, 38 journals); Medknow publications (28 journals); Indian journals.com (8 journals) and Kamala-Raj enterprises (5 journals). Libraries and information centers in India attached to various types of institutions are now taking part in open access movement, by establishing institutional digital repositories to provide worldwide access to their research documents. (Table 1)

Table 1: Indian Open Access Journals

Sl. No.	Publisher	Number of Titles
1.	Indian Academy of Sciences (IAS)	11
2.	Indian National Science Academy (INSA)	4
3.	Indian Medlars Center of NIC (MedInd)	39
4.	Medknow Publications	45
5.	Indian journals.com	12

3.2 Self Archiving

Making electronic preprints and post prints available on author home pages or depositing them in digital archives and repositories. Self-archiving serves two main purposes: it allows authors to disseminate their research articles for free over the internet, and it helps to ensure the preservation of those articles in a rapidly evolving electronic environment. A key problem with such archives is that they can be unstable, as authors move from institution to institution, retire, make other life changes or die. As will be seen later, e-prints from such archives are not made as easily visible to the research community as those in disciplinary archives or institutional archives and repositories because they cannot be easily harvested. While self archiving on repositories ensures their conformity with OAI-PMH enabling their publications to be harvested by Metadata Harvesting Services and general search engines like Google, archiving on their personal/institutional website may not.

3.3 Subject based E Print archives

E-prints are electronic copies of academic research papers, which may be in the form of pre-prints (papers before referring) and post prints (papers after referring). E-prints archive is simply an online repository of materials, freely available on the web for widest possible dissemination of knowledge. Archives may contain the research output of institutions, such as universities and laboratories, or disciplines such as physics, economics, mathematics etc. OA archives can be organized by discipline (e.g. arXiv for physics) or institution (e.g. eScholarship Repository for the University of California).

3.4 Institutional Repositories

Institutional repositories represent an important OA-channel and are relatively new developments in scholarly communication process compared to open journals and subject-specific repositories. Institutional Repository are repositories designed to manage, host, preserve and enable distribution of the scholarly output of an Institution. Institutional repositories are "a managed storage system with content deposited on a personal, departmental, institutional, national, regional, or consortial basis, providing services to designated communities, with content drawn from the range of digital resources that support learning, teaching and research".

The characteristics of IR include - Institution-based; Scholarly material in digital formats; Cumulative and perpetual; Open and Interoperable. Institutions and their libraries are in a better

position than individual researcher to guarantee that the material is available even after decades and that the collection is systematically maintained, for instance, to take account of changing file formats and media. Institutional repositories represent an integral part of the long-term strategies of the universities in question, in particular as these have to redesign their publishing and library policies to take into account the totally new conditions created by the Internet. The institution's own production of theses and working papers can easily be put up on such repositories, but in the long run the posting of the central production of the university's researchers, that is, their conference and, in particular, journal papers, is crucial. Although institutional repositories can be seen as useful marketing channels for individual universities their most significant impact on the global scale can only be achieved via co-operation via open access indexing services.

IRs are "digital archives of intellectual products created by the faculty, staff and students of an institution or group of institutions accessible to end users both within and without the institution. The IR may hold various kinds of publications, such as pre-prints and post-prints of journal articles, conference papers, research reports, theses, dissertations, seminar presentations, working papers and other scholarly items. This way, intellectual contributions of researchers are made accessible free of charge to the whole community of researchers across the world. Thus, the open access which was evolved out of the necessity of wider access to scholarly publication relies on the initiatives of individuals (self archives), institutions. It is more of a philosophy of facilitating wider communication, feedback and use.

A number of software packages both proprietary and free on net have been developed for archiving and managing digital collections. However open source software packages such as Dspace developed by MIT and HP (*http://www.dspace.org/*), E-prints developed by University of Southampton (*http://www.eprints.org/*), Fedora developed by University of Virginia and Cornel University (*http://www.fedora.info/*) are driving the OA movement especially the development of IRs in the world.

From 2000 onwards repositories have developed from being subject based to include the complimentary institutional based model and their growth has been fuelled by timely project funding from a variety of sources. Both the Registry of Open access repositories ROAR (http://archives.eprints.org) and the Directory of Open access Repositories OpenDOAR (www.opendoar.org) now evidence the increasing number and diversity of repositories: subject, institutional, national, national/subject, international, regional, consortia, funding agency, publisher and data archives.

United States accounts for 26.18% (22.96%), followed by Germany 11.44% (8.43%), United Kingdom 10.86% (10.87%), Japan 6.40%(4.57), Australia 5.04% (3.35%), The Netherlands 4.26% (2.33%), Canada 3.39% (3.96%), France 3.39% (3.96%) and so on as per the lists of Open DOAR and (ROAR) respectively. The developed countries account for about 70% of IRs. Among developing countries Brazil accounts for maximum IRs followed by India.

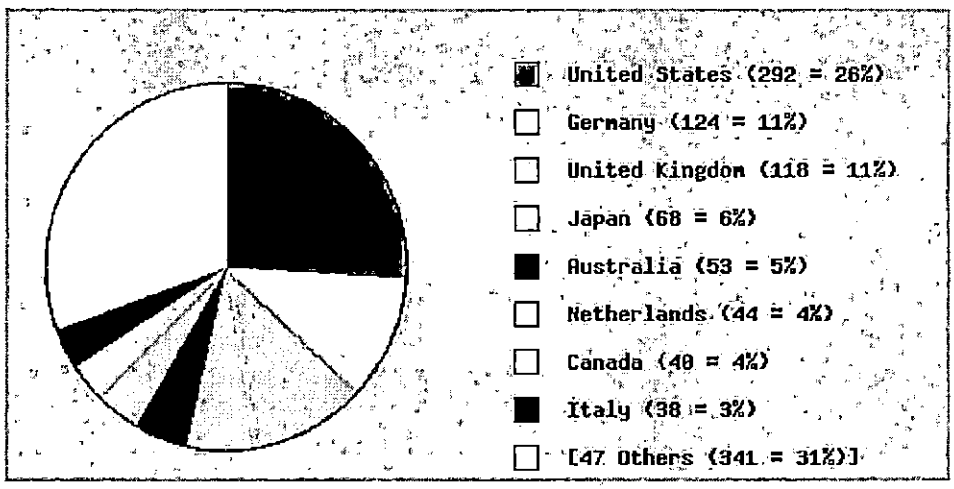


Fig.1: World wide Institutional Repositories

4. INSTITUTIONAL REPOSITORIES IN INDIA

In India, majority of the professionals are experiencing that accessing overseas information, particularly western countries, is easier than accessing Indian information or accessing information of the respective institute. The main reason for the non-accessibility of the Indian information is due to lack of developing e-information environment and putting Indian information on to the Internet or having their websites. Though some of the organizations have their own web (portal) and having good Internet bandwidth, not much effort has been to feed (host the Indian Information) or even the institutional academic or research output. Institutional repository needs to follow some standards, guidelines and procedure to make it compatible to share with international academia and research community or organizations also to work out the restriction and security. Availability of open source software has also accelerated major initiatives in India like disseminating new knowledge generated within the institutions or organizations which have resulted in another way of disseminating scholarly literature i.e. open access literature. In contrast to subscription-based literature, the open access literature does not have any restriction on access, and major initiatives in India like disseminating new knowledge generated within the institutions or organizations which has resulted in another way of disseminating scholarly literature, i.e. open access literature. In contrast to subscription-based literature, the open access literature does not have any restriction on access, and is free from any subscription fee or licensing fee. India is ahead of many developing countries and a few developed countries in terms of establishing a number of digital libraries or digital archives and creating digital contents for them. World communities have appraised Indian efforts, and contents of some digital libraries are regularly accessed in different parts of the world.

4.1. India Takes Lead

In India, some institutions, like Indian Institute of Science; Indian Institute Management, Kozhikode; Indian Statistical Institute, Bangalore; Indian Institute of Technology, Delhi; National Institute of Technology Rourkela; National Aerospace Laboratories (NAL); National Chemical Laboratory; Information and Library Network (INFLIBNET); National Institute of Oceanography; Raman

Research Institute; etc. have set up open access institutional repositories (IRs) that archive and disseminate research outputs of respective institutions. While self-archiving by authors is slowly picking up, mostly it is IR staff that collect and archive the documents to respective IRs on behalf of authors. There are some subject specific IRs as well, Librarian's Digital Library (LDL) of Documentation Research and Training Center (DRTC), Bangalore and OpenMed@NIC of National Informatics Centre, New Delhi are examples giving access to LIS and biomedical literature respectively. Vidyanidhi of University of Mysore is an example of document type specific collection that archives and provides access to theses and dissertations of Indian Universities. Some archives like OpenMed@NIC offer RSS (Really Simple Syndication or Rich Site Summary) feeds to the registered users, who also get notification on addition of new items in regular intervals. Search engines and metadata harvesters index most of the Indian operational repositories. Registry of Open Access Repositories (ROAR) from University of Southampton lists out 34 IRs of Academic and Research Institutions in India as depicted in Table 2. These IRs have adopted self-archiving model and have been using two most popular open source software – Dspace and GNU Eprints. Somehow ROAR has not listed few Indian IRs such as that of Indian Council for Research on International Economic Relations (*www.icrier.org/publications.html*), IITB (*www.library.iitb.ac.in/~mnj/gsdl/cgi-bin/library*), IIT Kanpur (*library.iitk.ac.in:8080/examples/thesis/index.html*), INSA Digital Library (*drtc.isibang.ac.in/insa*), Vidhyanidhi of University of Mysore (*www.vidhyanidhi.org.in*). A number of new initiatives still being in the initial stages are yet to be listed by ROAR.

Table 2: Indian IRs Listed by ROAR

Name	*Host Institution*	*URL*	*Items Jun 2006*	*Soft. Used*
Eprints@IISc	Indian Institute of Science, (IISc) Bangalore.	http://eprints.iisc.ernet.in/	5106	EPrints
Dspace@IIMK	Indian Institute of Management, Kozhikode (IIMK)	http://dspace.iimk.ac.in/	146	EPrints
Dspace@IIA	Indian Institute of Astrophysics (IIA)	http://prints.iiap.res.in/	998	DSpace
Dspace@NITR	National Institute of Technology, Rourkela (IITR)	http://dspace.nitrkl.ac.in/dspace/	269	DSpace
ETD@IISc	Indian Institute of Science (IISc)	http://etd.ncsi.iisc.ernet.in/	166	DSpace
Dspac@ INFLIBNET	INFLIBNET	http://dspace.inflibnet.ac.in	428	DSpace
Librarian's Digital Library (LDL)	Docum. Res. & Training Centre (DRTC)	https://drtc.isibang.ac.in/	249	DSpace
NAL Institutional Repository	Nat. Aerospace Laboratories (NAL)	http://nal-ir.nal.res.in/	886	EPrints
EPrints at NCL	Nat. Chemical Laboratory (NCL)	http://dspace.ncl.res.in/	354	DSpace
Digital Repository Service of NIO	National Institute of Oceanography(NIO)	http://drs.nio.org/drs/	141	DSpace
Dspace@NITR	National Institute of Technology, Rourkela	http://dspace.nitrkl.ac.in/dspace/	269	DSpace
Eprints at OWSA	OneWorld South Asia Open Archive Initiative	http://open.ekduniya.net/	89	EPrints

Name	Host Institution	URL	Items Jun 2006	Soft. Used
OpenMED at NIC	National Informatics Centre (NIC)	http://openmed.nic.in/	1125	EPrints
Eprint@DU	University of Delhi	http://www.du.ac.in/	104	EPrints
Digital Repository of RRI	Raman Research Institute (RRI)	http://dspace.rri.res.in/	1296	DSpace
Eprints@ Bioinf-ormation	Bioinformation	http://www.bioinformation.net/	#	EPrints
DSpace@UOH	University of Hyderabad	http://igmlnet.uohyd.ernet.in	#	DSPace
EPrints@IIMK	Indian Institute of Management, Kozhikode (IIMK)	http://eprints.iimk.ac.in/	146	EPrints
EPrints@IIITA	Indian Institute of Inf. Technology, Allahabad (IIITA)	http://eprints.iiita.ac.in/	#	EPrints
ISI Library, Bangalore	Indian Statistical Institute,Bangalore	http://library.isibang.ac.in: 8080/dspace/	#	DSpace
Eprints at RGCFB	Rajiv Gandhi Center For Biotechnology	http://www.rgcb.res.in/	#	EPrints
Eprints at Medknow	MedknowEprints	http://eprints.medknow.com/	#	Eprints
Delhi College of Engineering		http://202.141.12.109: 8080/dspace		Dspace
Bangalore Management Academy		http://bma.ac.in:8080/dspace/		Dspace
Cochin Univ of S * T (CUSAT)		http://dspace.cusat.ac.in: 8080/dspace/		DSpace
Guru Gobind Singh Indra-prastha Univ. N Delhi		http://dspace.ipu.ernet.in: 8080/dspace/		DSpace
ICFAI Buisness School		http://202.131.96.59: 8080/dspace/		Dspace
DU Eprint Archive		http://eprints.du.ac.in		Eprints
Eprints@IIT, Delhi		http://eprints.iitd.ac.in		Dspace

Number of items not available in ROAR and could not be ascertained through respective IR sites as some of them were not accessible.

4.2. Metadata Harvesters

Few Indian institutions have been experimenting metadata harvesting. Search Digital Libraries (SDL) of DRTC is one such service harvesting library information science subject-specific open access archives and repositories. The 'Knowledge Harvester@INSA', is an experimental initiative from Indian National Science Academy that harvests metadata from 3 archives. "SJPI Cross Journal Search Service" is a recent initiative from NCSI at IISc that harvests metadata from 13 Indian open access journals. Indian Institute of Technology, Delhi has initiated a metadata harvesting service called SEED that indexes 4 archives. NAL has initiated harvesting OAI compliant IRs of CSIR Laboratories in India and making them accessible through a unified search interface. All these metadata harvesters in India use PKP Harvester, developed by Public Knowledge Project UBC, Canada. Open J-Gate

(*www.openj-gate.org*), a free service on net is an open access journals indexing service initiated by Informatics India Private Limited. It covers more than 3,500 open access academic, research and industry journals world over of which > 1,500 are peer-reviewed scholarly journals. More than 0.3 million new articles added every year to this service.

4.3 Advantages of IR

- IRs provide a new and innovative channel of scholarly communication both for already published documents and the documents falling under the grey literature category.
- The most important advantage as opined by both IR system staff is that IRs provide wider access and visibility to the research output as in the case of Indian Journals which usually have low impact factors and are rarely cited. Providing access to these journal articles through IRs obviously enhances the visibility factor.
- The IRs play a vital role in the preservation of institution's heritage as the authorities/ faculty/ scientists would not permanently be in the institution but the IRs once built up, maintained and updated will continue to be the source for information on the research carried in the concerned institute irrespective of its age.
- The IT has reduced the publication delay as it helps faster communication and avoids duplication of work especially while preparing the manuscript, editing and reviewing. In spite of this the publication delay ranges from two months to one year by different journals even today. However, this delay is very minimal in case of IR.
- The grey literature like Technical Reports, Theses, in house publications are not generally published for wider circulation. IRs fill up this gap.
- IRs not only increase the prestige of institution but also increase the citation to the publications be it a grey literature or an item already published in a journal.
- IRs especially in India have brought an IT culture in the library and defined a new role of library in scholarly communication.
- Institutional Repositories strengthens research especially in Indian environment.
- While communication channels like journals and conference proceedings make available only scholarly communication, IRs provide an effective communication channel giving access to all kinds of documents including journal articles, conference papers, technical reports, thesis, in-house publications, patents, standards, images, teaching material, PPTs and so on.

4.4. Favourable Environment for IRs

- The National Knowledge Commission has suggested Institutional Level discussions to set up IRs.
- Quite a Good number of conferences/seminars/training programs have been conducted by DRTC, NCSI, NAL, IIM etc.
- Libraraians have taken lead in setting up of IRs. Indian library community has taken a lead to bring an awareness about open access through list-forums, Discussion forums, listserves etc.
- IRs are useful for developing country like Indian scholarly communication will grow. Visibility and import of Indian research output will increase.

4.5. Constraints of Institutional Repositories

Initial costs may be high as contributors perceive high risks. The Open Access Movement has a big challenge especially the publishing industry of journals under commercial sector challenging their sovereignty. The management support, availability of IR expertise, willingness of authors to participate are very important factors for the success and sustainability of IR.

- Absence of a well defined institutional policy is a serious constraint for IR development. Uncertainty will exist about the norms to be adopted for inclusion of documents regarding the person depositing the document, the need for review and technical evaluation of the document, types of documents to be included and the level access control.
- IR being a new development, there is serious lack of IR expertise especially in a developing country like India. Many institutions although serious to set up IR failed due to non-availability of IR expertise from both library and IT staff.
- The management and the authors concerned about forms a serious bottleneck in building the content of an IR. Many institutions fail to allocate sufficient funds for IR. The basic necessities like IR infrastructure availability of expertise can not be fulfilled without adequate funds
- Another important constraint is apathy of authors towards time consuming and lengthy deposition procedure.
- Ignorance of users in the absence of appropriate literacy program is another constraint with viz. one cannot expect any developments in IR.
- In case of journals and conference proceedings usually copyright of a research publication lies with the publishers. The publisher's rigid attitude for allowing the published item in IR and the authors concerned in this matter is another constraint to be sorted out appropriately
- A good number of institutions in India although have set up the IRs, but made them available only on the LAN of their institute or on a single system due to various reasons like copyright problem from publishers or reservation of their management to throw open their publications. Apathy of Creators/authors for depositing content
- Customization of open source software is a bottle neck
- They affect the balance of institutional power as some departments proceed faster than others.
- Nature of content: Classified/restricted and Unclassified/Open
- Diversity of content and the language used in the full texts
- They rely on unproven methods for long term digital preservation.

4.6. Suggested Measures

An Institutional Repository is the intellectual capital of an institute which recognizes the intellectual life and scholarship of our academic and research organizations. IRs facilitate building the digital collections to be searched and accessed freely by anybody in world. Above all, IRs preserve the heritage of the institute. Setting up of an IR needs a planned approach for the implementation tasks defined by their governance structure, management framework, operational strategies and a well documented workflow. Adoption of the standards and choice of models are critical factors for developing an IR.

More than 1,100 IRs have been set up in the world, and India with 34IRs as listed in ROAR leads the developing countries with in this regard. Most of the IRs particularly in India have neither preferred the governance and management structures nor documented the procedures and practices.

A good number of institutions in India although set up their IRs have not made the content open access due to various reasons. There is no perceived growth in the number of documents added to many IRs in the world. Apart from a good number of metadata harvesting services like OAISter, ARC, general Internet search engines like Google, Yahoo and SCIRUS also harvest the metadata of repositories in the world and give the links to the individual IRs for full texts. Among the IR software adopted DSpace and GNU Eprints are very popular and also are open source.

- The government and the governmental agencies including universities, and important research establishments like CSIR, ISRO, DRDO, ICAR, ICMR, ADE, DST, DBT have to take a policy decision for setting up of IRs in their respective organizations.
- An intensive awareness should be brought among both the librarians and the users (contributors and readers) covering the benefits of IR both for the individual concerned and the institution.
- Apart from inclusion of the topic IR as a part of syllabus in Indian L & IS curriculum.
- Need to conduct workshops and training programs leading for creating expertise in setting up of IRs.
- At national level, we need to develop the capability of customizing the Open Access software to suit local requirements.
- It would be nice if one arrives at consensus on standards to be adopted for implementation of IRs in the country.
- While one can think of announcing some incentives for contributions of research output to IR, one can also think of making it mandatory at individual Institutional level for contribution.
- While it is advisable to have IRs at the Institutional level, one can also think of setting up of metadata harvesting services covering different sectors both by organizations and by subject.
- There is a need to set up a Registry of Indian Repositories in line with ROAR and OPENDOAR registries.
- All leading universities and R&D establishments and also consortia coordinators should write to all commercial and societal publishers to allow individual scientist to deposit their research publications from the concerned individual institutional IRs. This would facilitate development of IRs without infringement of IPR of publishers.
- All institutions should provide necessary infrastructure including servers, PCs, scanners, internet bandwidth and software required for setting up of IR and also required funds and manpower.
- It is better for the institution intending to set up IRs to adopt one of the open source software like Dspace or Eprints as they are already popular and satisfy most of the functionalities of IR, open source and comply with all open source standards concerned.
- Apart from developing Institutional repository, the individuals can also think of making available publications through subject based e print archives and also individual personal websites as another step towards Open access movement.
- Libraries should also try to integrate OPACs with their respective IRs.
- Solutions to be found for Restricted reports, Copyrighted material access. Proper review required for unpublished and not peer reviewed material.

- There is a need to pick up the manpower training for developing IRs as well motivate the authors to submit their documents.
- There have been few open access declarations by few professional societies and also governments of few countries by legislation. This move is yet to picked up by other countries.
- A collaborative effort by academicians/scientists/users, librarians, IT professionals and archivists is required to develop a successful and sustainable IR.
- The self deposition of documents by the creators is yet to pick up in the world and in particular, India. The copyright restrictions of publishers discourage the authors to submit their papers to IR. However, many publishers including the commercial ones have relaxed their attitudes in this regard by allowing the copy of the final referred manuscript of the paper accepted for depositing in IR. The SHERPA's RoMEo Project serves as a directory of copyright policies of different publishers. Both IR Managers and the users recognize the important role of library professionals in the IR development.

5. CONCLUSION

It is satisfying to note that good number of institutions in the country are aware about IR developments and plan to set up IRs in their respective organizations. IR models should also be developed to address the issues and concerns and also understand the procedure and policies for implementing IRs. There is a lot of scope in India to develop IRs at institutional level under various apex bodies like CSIR, ICMR, ICAR, DRDO, ISRO, DST, UGC, etc,. It is advisable to have repositories at institutional level with harvesting facilities at apex body and national level.

Despite the growing strength of the Open Access movement, it is difficult to predict whether IR as a communication model would survive in the long run. The study concludes with a positive note as the current global momentum for Open Access is picking up results in setting up of good number of institutional repositories and there by realizing the goal of making freely available the intellectual output created using public funds.

The self deposition of documents by the creators is yet to pick up in the world and in particular, India. The copyright restrictions of publishers discourage the authors to submit their papers to IR. However, many publishers including the commercial ones have relaxed their attitudes in this regard by allowing the copy of the final referred manuscript of the paper accepted for depositing in IR. The SHERPA's RoMEo Project serves as a directory of copyright policies of different publishers. Both IR Managers and the users recognize the important role of library professionals in the IR development.

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Institutional Repositories: Role of Libraries

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Abstract: The demands of information users and researchers are increasing day-by-day. Old technologies of information exchange are being replaced by new technologies and methods. last few years open access, digital publishing material and the related activities of self archiving and creating institutional repositories have taken place of old methods. Library cultural is turning towards digitization. Today most of the libraries are automated. Libraries have always been engaged in managing and developing their collection. Libraries have long experience for collection building and maintain the information. Institutional Repository and open access will be the next challenge for Library and LIS professionals. The paper focuses on the Institutional Repositories, its characteristics, advantages and disadvantages, software for Institutional Repositories and role of libraries in Institutional Repositories.

Keywords: Institutional Repositories, Open Access

1. INTRODUCTION

Today we are the member of Information Revolution and we are living in information age. The demands of information users and researchers are increasing day-by-day. Old technologies of information exchange are being replaced by new technologies and methods. In this age internet become an essential medium for information exchange and with its helps to maintain scholarly communication anyone can communicate his/her information with another at anywhere in the world. The result is that from last few years open access, digital publishing material and the related activities of self archiving and creating institutional repositories have taken step. It's a new technique for digital college building, managing preserving information and creating new information in digital form in institutional and about institution or college. By using this repository the institution can offer services like dissemination of information, access to preserve and use information and as well as content submission and organization of information.

2. WHAT IS REPOSITORY?

Repository means formally organized and managed collection of digital content generated by faculty, staff and students at an institution. The main purpose of institutional repositories is to bring together and preserve the intellectual output of a laboratory, department and commitment.

According to Lynch

"University-based institutional repository is a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. In a university setting an Institutional Repository my provide a place for faculty work, students theses and dissertations, e-journals, datasets and so on."

Wikipedia an encyclopedia described IR as follows

An institutional Repository is an online locus for collecting and preserving in digital form the intellectual output of an institution particularly a research institution. For a university, this world include materials such as research journal articles before and after undergoing peer review

and digital versions of theses and dissertations but it might also include other digital assets generated by normal academic life, such as administrative documents, courses notes or learning objects.

Open access is one step ahead of free access. It holds to remove all barriers whether it is the matter of prizes or permission by using scientific communication medium and internet and Institutional Repository is a step towards open access.

Foster and Gibbons described an Institutional Repository as

"An electronic system that capture, preserves and provides access to the digital work products of a community."

3. ESSENTIAL CHARACTERISTICS OF INSTITUTIONAL REPOSITORY

Following elements that an Institutional Repository should have

3.1 Institutionally Defined

- Content generated by the community in an institution
- Content present historical and tangible embodiment of the intellectual life and output of an institution.
- Existing library consortia will be a platform
- Consortia could help rapid growth of IR

3.2 Scholarly Content

- Content include preprints, working papers published papers
- research material, Staff information, teaching material, thesis, dissertations
- research and technical reports, numerical and statistical report or data

3.3 Cumulative And Perpetual

- Formed by successive additions
- Material should included should be preserved for future scholars to use
- More and more material or information should accommodate
- IR will continue piling up day by day

3.4 Interoperable And Open Access

- The user outside the institute must be in a position to find out information form the repository.
- System should maintain and expose the metadata to allow other services to harvest and search the content.
- Internal and external users can access the content.

4. CONTENTS OF AN INSTITUTIONAL REPOSITORY

- Pre-prints of articles or research reports submitted for publication
- The text of articles accepted for publication in journal
- Revised text of published work with comments for academic readers

- Conference paper
- Teaching materials
- Students projects
- Doctorial theses and dissertations
- Datasets resulting for research projects
- Committee paper
- Computer software
- Works of art
- Photographs and video recordings

5. ADVANTAGES OF INSTITUTIONAL REPOSITORIES

Academic work available on the internet is read more widely than work published in paper format. Also academic work which is available at little or no cost is read more widely than work published in expensive conventional publication. Depositing academic work in university repository therefore increases the profile of an author on a world wide basis, increasing both the dissemination and the impact of the research they undertake.

The main advantages are:

5.1 For Users

- Expansion of the range of shared knowledge
- Opportunities to simplify and extend dissemination

5.2 For Institutions

- Enabling of IPR to be exploited more effectively at institutional level.
- Flexible ways to develop existing scholarly communications.
- Opportunities for new forms of scholarly communication
- Flexible ways to develop existing scholarly communication

5.3 For Researcher Community

The research community will be able to access the world's research available in different Institutional Repositories.

IR helps for faster communication and reduces the unwanted duplication.

6. DISADVANTAGES

The Institutional Repository also has some Drawbacks and that are as follows:

- In institutional there is no provision for long term digital preservation of information
- It needs attractive institutional support
- It needs good funding time by time.
- It will fail if the institution stops funding

7. KINDS OF SOFTWARE AVAILABLE FOR INSTITUTIONAL REPOSITORIES

There are number of software are available in market for institutional Repository. Some of them are on pay basis and some are free downloaded software for ex.: DSpace, GNU Eprints CDsware, Fedora, Greenstone. In these softwares DSpace, Greenstone, EPrint are free software. Dr. Mangala Hirwade and Dr. Anil Hirwade described the types and kinds of IR softwares and the use in different countries in table 1 there research paper "Institutional Repositories: Challenge and Opportunity for LIS Professionals in Digital Age"

Table 1: Number and kinds of software packages used for institutional Repositories

Sr.No.	Country	GNU Eprints	DSpace	CDSWare	ARNO	Fedora	DIVA	iTOR	other
1	Australia	7	3			3			24
2	Belgium		2						6
3	Canada		31						
4	Denmark		2				1		3
5	Germany	2	2						99
6	France	11	2						10
7	Sweden	3					10		12
8	Norway		1				1		5
9	Italy	7	3	1					6
10	UK	24	6						1

8. INSTITUTIONAL REPOSITORY IN INDIA

In India some institutions like Indian Institute of Management, Kozhikode; Indian Statistical Institute, Bangalore; Indian institute of Technology, Delhi; National Institute of Technology, Rourkela; National Aerospace Laboratories, Bangalore; National Chemical Laboratory, Pune; Information and Library Network, Ahmedabad; National Institute of Oceanography, Goa; Raman Research Institute, Bangalore have established open access institutional Repositories. Librarian's digital Library of Documentation Research and Training Center, Bangalore Vidyanidhi of University of Mysore are some popular repositories in India. The Institutional Repositories in India and the software used by them are as follows.

Table 2: Institutional Repositories in India

Name	*Institution*	*URL*	*No. of items (as on 1/03/ 2006*	*Types of Documents*	*Software used*
Librarian's Digital Library (LDL)	Documentation Research & Training Center (DRTC)	https://drtc.isibang.ac.in/	236	Research paper, Article, Reports, etc.	DSpace
Dspace at GBPUAT university	G.B. Pant Unviersity of Agricultural and Technology	https://202.141.116.205/ dspace/	82	Research paper, Articles, Reports, etc.	DSpace
IIA Repository	Indian Institute of Astrophysics	https://prints.iiap.res.in	725	Research paper, Articles, Reports, etc.	DSpace

Name	Institution	URL	No. of items (as on 1/03/ 2006	Types of Documents	Software used
Eprints@IIITA	Indian Institute of Information Technology, Allahabad	https://eprints.iiita.ac.in	22	Research paper, Articles, Reports, etc.	Eprints
DSpace@IIMK	Indian Institute of Management, Kozhikode (IIMK)	https://dspace.iimk.ac.in	133	Research paper, Articles, Reports, etc.	DSpace
Eprints@IIMK	Indian Institute of Management, Kozhikode (IIMK)	https://eprints.iimk.ac.in	25	Research paper, Articles, Reports, etc.	Eprints
Eprints@IISC	Indian Institute of Science (IISC)	http://eprints.iisc.ernet.in	3645	Research Papers, Articles, Reports, etc	Eprints
ETD@IISc	Indian Institute of Science (IISC)	http://etd.ncsi.iisc.ernet.in	153	Theses and Dissertation	DSpace
Eprint@IITD	Indian Institute of Technology, Delhi (IITD)	http://eprint.iitd.ac.in/dspace	1296	Research Papers, Articles, Reports, etc	DSpace
Dspace at INSA	Indian National Science Academy (INSA)	http://61.16.154.195/dspace	818	Conference Papers, Articles, Reports	DSpace
ISI Library, Bangalore	Indian Statistical Institute, Bangalore	http:// library.isibang.ac.in:8080 / dspace	10	Research Papers, Articles, Reports, etc	DSpace
Dspace at INFLIBNET	INFLIBNET	http://dspace.inflibnet.ac.in	428	Research Papers, Articles, Reports, etc	DSpace
NAL Institutional Repository	National Aerospace Laboratories (NAL)	http://nal-ir.nal.res.in	418	Research Papers, Articles, Reports	Eprints
Dspace at NCRA	National Centre for Radio Astrophysics	http://ncralib.ncra.tifr.res.in /dspace	22	Research Papers, Articles, Reports, etc	DSpace
Eprint at NCL	National Chemical Laboratory (NCL)	http://dspace.ncl.res.in	290	Theses, Research Paper, Articles, Reports, etc	DSpace
OpenME@NIC	National Informatics Center (NIC)	http://openmed.nic.in	1035	Research Papers, Articles, Reports, etc	Eprints
Digital Repository Service of NIO	National Institute of Oceanography	http://drs.nio.org/drs	55	Journal articles, conference proceeding articles, Technical Reports, Thesis, dissertations, etc	Dspace
Dspace@NITR	National Institute of Technology, Rourkela	http://dspace.nitrkl.ac.in/ dspace	223	Theses, Research Paper, Articles, Reports, etc	Dspace
Digital Repository of RRI	Raman Research Institute	http://dspace.rri.res.in	1064	Research Papers, Articles, Reports, etc	DSpace
Vidyanidhi	University of Mysore	http:// www.vidyanidhi.org.in	1835	Theses and Dissertations	DSpace

9. ROLE OF LIBRARY IN INSTITUTIONAL REPOSITORY

Libraries have always been engaged in managing and developing their collection. LIS professional are always in font of new technology and they accept it and trying to develop their library services. Libraries have long experience for collection building and maintain the information. Institutional Repository and open access will be the next challenge for Library and LIS professionals. As a Result libraries have to play vital role in building Institutional Repositories. Libraries are able to provide direct access to scholarly publication via IR rather than any other. The Institutional Repositories are successful because of its new information and current information. It related with the producer of being responsible for adding an item to a repository and creating the associated metadata.

And the libraries can undertake the lead role in development of the institutional repositories and their normalization with collection management. Institutional Repositories needs satisfactory and trained staffing support having knowledge of Institutional repository and to overcome this problem library would have to train their staff member or would have to requite librarians who have good knowledge about IR and who can handle well digital collection management. Libraries would have to arrange the training program for the user and the students for handling and searching the collection and addition. After all these things the only single work is remained that the Institute's head have to invest the money of it needs funding by using the LIS staff can build a good IR. And deliver their Information Facilities to develop their institute or college.

10. CONCLUSION

The Libraries have long experience with developing and managing content collections. After observing the advantages and disadvantages we get to know that IR has more advantages. It is useful to all the users of library. Libraries have always been engaged in managing and developing their collection. LIS professional are always in front of new technology and they accept it and trying to develop their library services. Services like dissemination of information, access, preservation and use information and content submission and organization of information become useful which helps libraries to follow all five Laws of Library Science. Libraries should have to take part in Institutional Repositories. Libraries or Librarians can play vital role in building and maintain Institutional Repositories. University libraries and the librarians have to play a major role in developing successful repositories for their institution.

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Open Access Journals in India

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Abstract: Open access is a cost-effective way to disseminate and use information. It is an alternative to the traditional subscription-based publishing model made possible by new digital technologies and networked communications. The open access literature available in various forms like open access archives, institutional repositories, open access journals and off late open courseware. This paper discusses various open access journal initiatives in India. The overall aim of the research was to gather the data related to open access journal initiatives in India with respect to its type, funding agency/ host organisation, Full Text availability, article charges etc. Results shows that all 165 open access journals are peer reviewed, indexed and abstracted in various indexing and abstracting services, listed with DOAR and O-Jgate. These journals are primarily published or funded by government agencies such as ICAR, ICMR; academies such as IASc, INSA; learned societies; associations, commercial publishers and even editors. Only two journals out of 165 journals ask for article charges to authors to submit their articles.

Keywords: Open access journals, Open access publishing,

1. INTRODUCTION

1.1 The Concept of Open Access

Open-access (OA) literature is digital, online, free of charge, and free of most copyright and licensing restrictions. Open access is a cost-effective way to disseminate and use information. It is an alternative to the traditional subscription-based publishing model made possible by new digital technologies and networked communications (ARL, 2003).

1.2 The Budapest Open Access Initiative

In December 2001, the Open Society Institute convened a meeting of prominent scholarly communication change agents in Budapest that strongly influenced the nascent open access movement. The result of this meeting was the "Budapest Open Access Initiative" (BOAI). It defines Open Access as follows

- Open Access mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. 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.
- Open Access is compatible with copyright, peer review, revenue (even profit), print, preservation, prestige, career-advancement, indexing, and other features and supportive services associated with conventional scholarly literature.
- Open Access removes price barriers (subscriptions, licensing fees, pay-per-view fees) and permission barriers (most copyright and licensing restrictions) (Prosser, 2004)

To achieve open access to scholarly journal literature, BOAI recommended two complementary strategies.

I. Self-Archiving:

Where scholars deposit their refereed journal/conference articles in open electronic archives, a practice commonly called, self-archiving. When such archives conform to standards created by the Open Archives Initiative, then search engines and other tools can treat the separate archives as one. Users then need not know which archives exist or where they are located in order to find and make use of their contents.

II. Open-access Journals:

Open access journals are scholarly journals that are available to the reader "without financial or other barrier other than access to the internet itself.

Open access journals have the following characteristics:

(1) they are scholarly,
(2) they utilize quality control mechanisms like those of conventional journals
(3) they are digital;
(4) they are freely available,
(5) they may allow authors to retain their copyrights, and
(6) they may use Creative Commons or similar licenses

There is some dispute as to whether open access journals must utilize peer review as a quality control mechanism. Most do, but there are also some high quality journals that don't and meet all other criteria, yet have great impact on their fields of study. *D-Lib Magazine* is an example of such a journal. Likewise, the question of whether the journal must use a Creative Commons or similar license is another area of dispute. This dispute reflects the deeper, fundamental question of whether "open access" is just free access or free access plus a set of specified use rights that go significantly beyond normal copyright rights.

2. OPEN ACCESS JOURNAL INITIATIVES IN INDIA

A large number of the journals published from India belong to learned societies and associations, and are published by the association or the editor themselves without the involvement of any commercial publisher. The members of these learned societies receive the print copies of the journals without paying an annual or recurring fee. For continuing their publication activities the associations depend on non-member subscriptions, which are limited in number and restricted by and large to the Indian universities and colleges, on advertisements in print editions, and on income generated from other sources such as the annual conferences of the associations. Most of the Indian journals suffer from 'low circulation - low visibility - low impact factor' syndrome. With many fewer paid regional or international subscriptions, these journals have limited visibility, restricted mainly to the members of the association. With this limited visibility, these journals are cited less frequently than their western counterparts. The low impact factor inhibits authors from submitting their quality work to the Indian journals. Thus, it is expected that with OA, Indian journals will be able to reach to a wider audience. At the same time, loss, if any, of paid non-member subscriptions is less likely to have a major effect on the economics of these journals.

A number of biomedical journals have been online from late 1990s; Neurology India, Current Science, Indian Pediatrics, and the Indian Journal of Critical Care Medicine have been online since 1998–99. These individual endeavours have now evolved into more organised and collaborative efforts,

including those of the *Indian Medlars Centre*, the *Indian Academy of Sciences*, and the *Indian National Science Academy* under the not-for-profit sector, and *Medknow Publications* in the commercial segment. International players such as *Bioline International* have also helped many Indian journals to have web presence (Sahu & Parmar, 2006).

3. OBJECTIVES OF THE PRESENT STUDY

The overall aim of the research was to gather the data related to open access journal initiatives in India in respect with its type, funding agency/host organisation, Full text availability etc.

There were six broad objectives, which are as follows:

- To identify Open access journal initiatives in India and their number
- Subject coverage
- Funding agency or Host organization
- Indexing and abstracting
- Full text availability
- Online/Print format
- Article Charges

4. METHODOLOGY OF PRESENT STUDY

The first step in the data gathering process was the identification of Open access journals. To compile the list of Open access journals the researcher used various sources of information as follows

1. Literature
2. Search using search engines especially Google
3. Directories of archives/repositories
4. Blogs
5. Wikipaedia
6. Portals
7. Education & Training institution websites especially Indian institutions
8. LIS Forum mails and others forums / discussion groups

After identifying the open access journals researcher visited respective web pages and gathered information which was analyzed based on certain parameters such as Type of Model, Funding agency or Host organisation, fulltext availability etc are presented in Table No 1. Also researcher contacted a few journal publishers and editors for certain information which was not available from journal websites. However major open access journal initiatives are discussed below.

4.1 Indian Medlars Centre

The Indian Medlars Centre (IMC), set up jointly by the *National Informatics Centre* and the *Indian Council of Medical Research*, has taken the pioneering step of putting Indian biomedical journals accessible from a single platform. IMC's first bibliographic database *IndMed*, established in 1998, provides abstract level information from more than 70 journals. Each of the articles in the database is tagged with Medical Subject Headings. In 2003, IMC launched its full-text database,

MedInd, which now hosts full text version of 40 journals in PDF format. The understanding between the journals and the IMC ensures that the digitised work hosted by IMC will continue to be accessible even if the journal discontinues providing newer issues.

4.2 Indian Academy of Sciences

The Indian Academy of Sciences (IAS), founded in 1934, publishes 11 journals with the basic philosophy that no journal published by the Academy is in competition with another journal published in the country. Current Science, published by the Current Science Association in collaboration with the IAS, has entire back volumes from 1932 online in PDF format and has been online since 1999. Many other journals including the Journal of Biosciences, Sadhana, and Pramana also have the entire back volumes online.

4.3 Indian National Science Academy

The Indian National Science Academy (INSA), established in 1935, publishes four journals including the Proceedings of INSA. Under the project 'Building Digital Resources: Creating Facilities at INSA for hosting S & T Journals on Online', INSA launched the Open Access version of these journals in December 2003.

4.4 Medknow Publications

Medknow Publications is a commercial publisher providing publishing services to 63 biomedical journals. These journals provide immediate free access and do not charge the author or author's institution for publication of the articles. The journals also permit authors' self-archiving. Most of these journals are archived at multiple places included OAI-compliant e-print repositories and sites such as Bioline International (www.bioline.org.br). The journals are also linked from DOAJ (www.doaj.org) and PubMed through LinkOut. Also these journals are indexed with important bibliographic databases including Index Medicus and EMBASE.

Table 1: List of Open access journals

Name of Publisher/ Host Organization	*No*	*Full text availability*	*Subscription required for print format*	*URL*
Indian Academy of Sciences	11	Varies	Yes	www.ias.ac.in/pubs/journals/
Indian Medlars center, National Informatics Centre	40	Varies	Yes	http://medind.nic.in/
Indian National Science Academy	3	2006	Yes	http://www.insa.ac.in/
Medknow Publications	63	Varies	Yes	http://www.medknow.com
Kamla-Raj Enterprises	7	Varies	Yes	http://www.krepublishers.com
Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology/ Anil Aggrawal	1	2000	No print but in CD	http://www.geradts.com/anil/ij/indexpapers.html
Calicut Medical Journal / CMC Alumni Association	1	2003	No print	http://www.calicutmedicaljournal.org/
Carbon -Science and Technology/ Applied Science Innovations P Ltd	1	2008	No print	http://www.applied-science-innovations.com/indexpagej.htm
Conservation and Society/ Ashoka Trust for Research in Ecology and the Environment' (ATREE), Bangalore	1	2003	Yes	http://www.conservationandsociety.org/

Name of Publisher/ Host Organization	*No*	*Full text availability*	*Subscription required for print format*	*URL*
Contemporary Issues and Ideas in Social Sciences/ Society for Research in Social Sciences	1	2005	No print	http://journal.ciiss.net/index.php/ciiss/index
DESIDOC: Journal of Library and Information Technology/ DESIDOC	1	2008	Yes	http://publications.drdo.gov.in/ojs/index.php/djlit/index
E-Journal of Chemistry : An International Quarterly Research Journal of Chemistry/ WWW Pub-India	1	2004	Yes	http://www.ejchem.org/indexed.asp#
ICMR BULLETIN/ Indian Council of Medical Research	1	2000	Yes	http://icmr.nic.in
Indian Folklife/ National Folklore Support Centre	1	2000	Free Print copy	http://wiki.indianfolklore.org/index.php?title=Category:Indian_Folklife
Indian Journal of Medical Informatics / Indian Association for Medical Informatics	1	2007	Yes	http://ijmi.org
Indian Journal of Neurotrauma/ Neurotrauma Society of India.	1	2004	Yes	http://www.ijntonline.com/
Indian Pacing and Electrophysiology Journal/ Indian Heart Rhythm Society	1	2002	No print	http://www.ipej.org/
International Journal of Computer Science and Applications / Technomathematics Research Foundation	1	2004	No Print	http://www.tmrfindia.org/ijcsa/aim.html
International Journal of Cyber Criminology / K. Jaishankar	1	2007	No Print	http://www.cybercrimejournal.co.nr/
International Journal of Integrative Biology/Omics Group	1	2007	No print	http://www.classicrus.com/IJIB/
Internet Health/VirtualMed	1	2003	No print	http://www.internet-health.org/
Journal of Association of Physicians of India /Association of Physicians of India	1	2000	Print and CD	http://www.japi.org/index.html
Jkscience: Journal of Medical education and research/ Dr. Annil Mahaja	1	2004	Yes	http://www.jkscience.org/
Journal of Neonatology/ The National Neonatology Forum (NNF)	1	2003	Yes	http://www.jnnfi.org/
Journal of Orthopaedics/ Calicut Medical College	1	2004	No print	http://www.jortho.org/
Journal of Semi-Arid Tropical Agricultural Research /ICRISAT	1	2005	No Print	http://ejournal.icrisat.org/archives.htm
Journal of the Indian Academy of Geriatrics /Indian Academy of Geriatrics	1	2005	Yes	http://www.jiag.org/index.html
Journal of Tropical Agriculture/Kerala Agricultural university	1	2001	Yes	http://www.jtropag.in/index.php/ojs/about
KnowGenesis : International Journal for Technical Communication / KnowGenesis	1	2006	Yes	http://www.knowgenesis.com/journal/index.php?journal=IJTC

Name of Publisher/ Host Organization	No	Full text availability	Subscription required for print format	URL
Law, Environment and Development Journal (LEAD Journal)/ SOAS, IELRC	1	2005	No print	http://www.lead-journal.org/index.php
Online Journal of Health & Allied Sciences/ B. S. Kakkilaya	1	2002	No Print	http://www.ojhas.org/index.htm
Pharmacognosy Magazine / Phcog.Net, Al-Ameen College of Pharmacy,	1	2005	Yes	http://www.phcog.net/phcogmag/about.htm
Pharmacognosy Reviews / Pharmacognosy Network Worldwide	1	2007	Yes	http://www.phcogrev.com/contact.htm
PULMON-The Journal of Respiratory Sciences/ Academy of Pulmonary and critical care medicine	1	1999	Yes	http://www.pulmononline.org/
Sankhya: The Indian Journal of Statistics/Indian Statistical Institute	1	2003	Yes	http://sankhya.isical.ac.in/index.html
Solapur Medical Journal/Dr. V. M. Govt. Medical College	1	2004	Yes	http://vaishampayan.org/smj/
The International Journal of Criminal Justice Sciences (IJCJS) / K. Jaishankar	1	2006	No Print	http://www.ijcjs.co.nr/
Bombay Hospital Journal/ Bombay Hospital Institute of Medical Sciences	1	1996	Yes	http://www.bhj.org/index.htm
Journal of the Indian Medical Association/ Indian Medical Association,	1	2007	Yes	http://www.jimaonline.org.in/jimastart.html
Indian Heart Journal/ Cardiological Society of India	1	2001	Yes	http://indianheartjournal.com/index.htm
VetScan/Society For Advancement of Veterinary Education	1	2006	No Print	http://www.vetscan.co.in/
Money & Finance/ Icra Limited	1	1997	Yes	http://www.icraratings.com/
Medico-Legal Update/ Dr. R.K. Sharma	1	2004	Yes	http://www.medicolegalupdate.org/
Indian Journal of Forensic Medicine & Toxicoloy/ Dr. R.K. Sharma	1	2007	Yes	http://www.ijfmt.com/
Indian Journal of Physiotherapy & Occupational Therapy/ Dr. Archna Sharma	1	2007	Yes	http://www.ijpot.com/htmlpages/
Journal of the Indian Institute of Science/ Indian Institute of Science	1	2001	Yes	http://journal.library.iisc.ernet.in/index.html
Total	165			

5. FINDINGS

5.1 Number of Open access Journals

From various sources and through search it is observed that there are 165 Open Access journals available online in India. According to the study done by Sahu (2006) India is placed 5th in the list of Open Access (OA) journals, well ahead of countries such as the Netherlands, China, Germany, Australia, and so on, which have higher number of online journals. Among the low-income countries, India ranks second only to Brazil for the number of OA journals. Almost 50% of the online journals from India are Open access.

5.2 Subject Coverage

Looking at the subjects covered by all 165 journals, they were broadly classified into two subjects i.e. Social Sciences and Science and Technology. There are 17 journals deal with Social Sciences, which includes law, Library and Information Science etc. Rest of the 148 journals are dominated by Science and Technology related subjects which includes Biomedical Sciences, Mathematics, Physical Sciences etc.

5.3 Open access Journal Publisher / Host Organization

From the Table No 2 it is observed that most of the journals are published or funded by government agencies such as ICAR, ICMR; academies such as IASc, INSA; learned societies; associations, commercial publishers and even editors. About 103 journals are published or hosted on half of journal such as Medknow and Indian Medlars Center, 26 journals are published by government agencies and academies, 5 journals from Learned societies, 4 journals by Associations, 9 journals by commercial publishers, 2 journals by hospitals, 7 journals by editors and rest i.e. 14 are published by research organizations, forums, Public Limited Company, Non profit organisations etc.

5.4 Indexing and abstracting

All journals are peer reviewed, indexed and abstracted in premier indexing and abstracting services such as Index Medicus, Chemical Abstracts Service, SCIRUS, SCOPUS, EMBASE etc. also they are also linked from DOAJ, PubMed and OJ Gate. But the concept of Metadata harvesting and journal indexing services is still not familiar to the Open access journal publishers. Most of the Publishers simply upload the new issues of journals in their respective websites. This creates another major problem for the metadata harvesters and search engines. National Centre for Science Information (NCSI) at IISc, Bangalore has initiated a project called "Scientific Journal Publishing in India", sponsored by Asian Media Information and Communication Centre, Singapore (a division of IDRC, Canada). Through this project, NCSI campaigns to the open access journal publishers of India for early adaptation OAI-compliant architecture using Open Journal System (OJS) or similar software. (Ghosh, and Das, 2006)

5.5 Full text availability

Online full text availability of all 165 journals varies which has been presented in Table No. 1. In general their archives are mostly available from 1998 onwards. One of the oldest archive available online is the Journal of genetics published by Indian Academy of Sciences that dates back to 1910. Another journal, Journal of Pharmacology published by MedKnow Publication provides archive from 1969 onwards.

5.6 Online/Print format

Out of 165 Open access journals 14 journals are exclusively available only in online format i.e. they are not produced in print format or any other format. Rest 151 journals are available in print as well as online format. They are called hybrid journals - print plus electronic, with the print version sold against a subscription. The open access journals are free to access but not free to produce. OA publishers need money to cover the cost of publishing. According to Sahu (2006) the cost for publishing is shared by subscriptions to the print journals, advertisements in print and online media, association membership fee, author reprints and grants from the government.

The journal titled 'Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology' is available online and CD format. Another journal named 'Journal of Association of Physicians of India' available in print, CD and online format. All 151 Open access journals are freely accessible online but print and CD are distributed on subscription by the publishers except one journal titled 'Indian Folklife' published by National Folklore Support Centre distributes free print copies.

5.7 Article Charges

Even though all 165 journals provides open access or free access to reader but there are two journals where submission of articles to the journal is not free. They are author payable journals: these are Carbon – Science and Technology and International Journal of Human Genetics

Carbon – Science and Technology" asks authors nominal Obligatory Article Charge of Indian Rupees 9000 only (Approximately US $ 250), towards partial support of the publication of the article and production and maintenance of the database, which the authors must pay. Also supplementary Information can be published online and has a deposit fee of Indian Rupees 1500 only (for up to 10 MB of disc space). Supplementary Information can contain multimedia files, pdf files, word files etc. Authors from under-developed and developing countries can make a formal request for Article Charge Wavier. In such cases, quality of the articles is the sole criteria for such decisions.

International Journal of Human Genetics published by Kamla-Raj Enterprises, asks authors to pay for processing fee of the paper and photograph (if any in the paper) because the journal is available in print format as well. The corresponding author or first author gets a free print copy, but the other contributor/s need to buy a print copy. It is interesting to note that six other journals are published by Kamla-Raj Enterprises but do not ask authors to pay for article submission.

6. CONCLUSION

With the number 165 open access journals it can be said that India has made important contributions towards the growth of Open access publishing. Also there are efforts been done through Open Access advocacy programmes conducted by NCSI, IISc, Indian Medlars, MedKnow etc. to create awareness among the scholarly community. This is making many Indian journals to become OA journals causing maximum access, visibility and impact to the research done in India. This is again evident from study done by Sahu (2006) that nine journals which are providing free access for last 3 years have reported no loss of subscriptions to the print version and in fact, have gained from the increasing subscriptions. Many journals which were running into losses are now self-sufficient to run the shown. It could be concluded that open access helps to improve the accessibility of the journals.

Even though overall picture of open access publishing in India looks promising, it makes unhappy situation because in India there are more than 300 universities and institutions of higher learning and

hundreds of research laboratories, both in the government sector and in the private sector, but there are only 165 open access journals and 33 registered archives. The situation can turn dramatically, if national donor agencies such as the Department of Science and Technology and the Department of Biotechnology, and heads of major research councils such as the CSIR, UGC decide that the results of all publicly funded research should be made available through self archiving and encourage open access journal publishing initiatives.

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Open Educational Resources, Courseware and Repositories: A Paradigm Shift in e-Learning

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Abstract: To cope up with the technological advancement and the constraints of various copyright laws, price hike, etc, the concept of open source educational resources and open courseware have been evolved. The open educational resources have played a vital role in e-learning without fee. The motto of educational for all irrespective of physical boundaries might be fulfilled by this way of learning. The leading institutions are now providing the educational contents free of cost to all. This paper discusses about the free and open source software and their characteristics; deals with the various open educational resources and their characteristics, and highlights the various national and international attempts made in this area. Also discusses the various categories of freedoms in this paper.

Keyword: OER, Open Educational Resources, OCW, Open Courseware, FOSS

1. INTRODUCTION

The overall shape of information society keeps on changing. It has become difficult to imaging the coming future due to technological advancement. Just think the scenario about 20 years back, Microsoft and IBM had their empire in the software field. Everything was priced and the computer people were totally dependent upon them. But now there is just totally different situation. To break the monopolies of these commercial vendors, people have come forward and the concept of open access, free software and open educational resources has been evolved. Information and communication technology (ICT) is an important driving force to bring out this change.

The free worldwide online encyclopedia, educational resources, open course materials, open and free online degrees, many computer operating systems, software with source code, etc., show the open source revolution. Now-a-days, many of these are available to the users freelyand also free of cost in the most of the cases.

2. FREE AND OPEN SOURCE SOFTWARE

With the technological advancements and to cope up with the copyright issues, free and open source software (FOSS) established itself as vital software resources in almost all the areas of ICT. FOSS refers to software distributed under a license which is recognised either as free software or open source software (OSS). Basically, the open source software has its roots in free software. The Free Software Foundation defines the free software as the software that gives the user the freedom to share study and modify it. It is called the free software because it is available free to any user. It is a matter of users' liberty, to run, copy, distribute, study, change, and improve (Hoe, 2006; Liang, 2007). The free software is provided by Free Software Foundation (FSF) and open source software by Open Source Initiatives (OSI).

3. CHARACTERISTICS OF OPEN SOURCE/ FREE SOFTWARE

The FSF has identified the four characteristics, i.e., freedom 0 to freedom 3 of FOSS (Hoe, 2006). In addition, following there are some more characteristics:

- Freedom 0: The freedom to run the program, for any purpose.
- Freedom 1: The freedom to study how the program works, and adapt it to users' needs. The access of the source code is a precondition for this.
- Freedom 2: The freedom to redistribute copies, so the user can help others.
- Freedom 3: The freedom to improve the program and release improvements for the benefit of masses.
- Freedom 4: It should be commercial but not priced.
- Freedom 5: It should be under GPL (General Public License).
- Freedom 6: The licenses of free software are based on copyrights.
- Freedom 7: The software manuals should also be available free of cost.

4. OPEN KNOWLEDGE INITIATIVE

The Open Knowledge Initiative (OKI) is a Massachusetts Institute of Technology (MIT) led community effort that has defined a service-oriented architecture to facilitate the construction and use of educational applications. OKI promotes specifications that describe how the components of a software environment communicate with each other and with other enterprise information and communications systems (MIT, 2008). The project is based on a modular and layered approach, which separates different types of services needed to support learning activities.

5. OPEN EDUCATIONAL RESOURCES

Open Educational Resources (OER) can be defined as free and open digital publication of high quality materials organised as courses that include lectures, related reading materials, snapshots of discussions, assignments, evaluations, etc. Access to these resources radically breaks down the barriers to quality education and allows everyone to access course material that is prepared and evaluated by experts. Further, the educational resources available under the OER format have been evaluated, not only by subject experts but also by education experts, to increase the educational utility of this material. In recent years, open educational resource materials have been prepared in an open standard format and are interactive in nature (National Knowledge Commission, 2007).

Open Educational Resources (OER) is a term that emerged in UNESCO's 2002 Forum on the "Impact of Open Courseware for Higher Education in Developing Countries", funded by the William and Flora Hewlett Foundation. It is intended to denote "educational materials and resources offered freely and openly for anyone to use and under some licenses remix, improve and redistribute" (UNESCO, 2004; Wikipedia, 2008).

Many OER initiatives have been motivated by the ideals of open science. It has sometimes been argued that all knowledge should be openly accessible and reusable, so that it can lead to societal benefits. The creation of knowledge occurs incrementally, by reinterpreting and adding to the existing body of knowledge. Proprietary and secret knowledge, therefore, can be viewed as unfair appropriation of the work of others. Particularly in the Western enlightenment movement, free knowledge has historically been perceived also as a key to individual freedom and social progress. As a result, the idea of free access to knowledge is deeply rooted in the norms of science. The OER tends to be associated more with the academic sector than with the association, charitable organization, or corporate sector. The availability and inclination of academic subject matter experts to participate in

a movement of this sort is perhaps a driving reason for the academic stronghold in the movement, but certainly, portions of the work being done by technical and management support organizations like Tech Soup fit under the OER umbrella, and groups like LINGOs are primed for making a more meaningful contribution to it than they appear to have done to date. The OER movement was partly inspired by the open source software movement where one gives software for free and allows others to use and improve it.

OER will facilitate educational transformation in essentially two ways. Firstly, it will be integrated into the existing educational practices, where the adoption of new technologies will gradually lead to new forms of practice. Secondly, the impact and benefits of OER on existing practices can, in principle, be studied by analysing how OER increases their efficiency (Tuomi, 2006). OER will, however, also enable qualitatively new practices and new approaches in organizing education and learning. In this case, the potential benefits need to be described qualitatively. Efficiency, by construction, can only measure improvement in a given process and it cannot, by definition, compare the benefits of incomparable things. When educational processes and objectives qualitatively change, new systems are needed for measuring their performance and benefits.

5.1 Historical Development of Open Educational Resources

The credit to start OER goes to MIT, USA. This was followed by the Open Courseware Consortium which is a by-product of MIT's OER initiative, and its rate of growth makes this a clear success in the educational field. Free online encyclopedia, i.e., Wikipedia, Online collection, i.e., Project Gutenberg, Linux as operating system, software such as openoffice.org, browser as Mozila, Google as search engines are some milestones in the Open CourseWare (Bissell, 2007).

5.2 Characteristics of Open Educational Resources

- OERs provide teaching and learning materials that are freely available and offered online for anyone to use.
- While some OERs include Open CourseWare or other educational materials, these may also offer the means to alter those courses through editing, adding to those courses through publication, and the ability to shape the tools that share those resources.
- These may maintain forums or other platforms where individuals can collaborate on building educational tools and documentation and the reach for those materials.

6 OPEN EDUCATIONAL RESOURCES IN INDIAN SCENARIO

6.1 National Programme on Technology Enhanced Learning

National Programme on Technology Enhanced Learning (NPTEL) is a joint venture by Seven IITs (Delhi, Kanpur, Kharagpur, Mumbai, Chennai, Roorkee, Guwahati) and India Institute of Science, Bangalore, funded by Ministry of Human Resource Development, Govt of India. With the objective to enhance the quality of engineering education in the country by developing curriculum based video and web courses, this programme is initially started in five major engineering subjects, i.e., Civil Engineering, Computer Science and Engineering, Electrical Engineering, Electronics and Communication Engineering and Mechanical Engineering. Faculties from these institutions are involved in developing their classroom course materials in electronic forms. Currently, the program has 120 web based courses and 115 video courses in the core sciences, computer science, civil engineering, electrical engineering, electronics and material engineering. The NPTEL also provides an opportunity

for teachers and students from rural areas to learn from these high quality lectures and improve the quality of teaching in these rural colleges. The approximate cost of development of material per course is about Rs. 500,000 to 600,000. One must have to register himself to access the site's contents (National Knowledge Commission, 2007; Das, 2008).

6.2 Ekalavya Project

The Ekalavya project is an attempt to generate an interactive platform for the creation, absorption, dissemination, and usage of knowledge for the well being of the individual and the society. It is a significant step forward to bring together students, teachers, and working professionals to meaningfully enhance the productivity of the group and spread knowledge. The Ekalavya portal aims at a free exchange of knowledge and ideas, by placing all the relevant academic material in the open source, thus making considerable contribution to society. It is envisaged that the Ekalavya project will become an all-encompassing activity over the years, using IT effectively for education. It aspires to build large collaborative communities where seekers are matched by the givers. This project is launched by IIT, Bombay. In this project, the content are developed in various Indian languages and are distributed through the internet. The Ekalavya project has also developed an Open Source Educational Resources Animation Repository (OSCAR) and provides web-based interactive animations for teaching various concepts and technologies. OSCAR provides a platform for mentors/professors to suggest ideas for animation and for developers/students to create content based on the suggested ideas and guidance. Funding for the Ekalavya and OSCAR project comes mainly from private industry (National Knowledge Commission, 2007).

6.3 Education-Grid

The Education Grid portal is provided as a platform for the educational community to support generation and sharing of education resources across different institutions, universities, and colleges of higher education. The portal also intends to facilitate collaboration, sharing of knowledge, best practices and cooperation to improve the quality of education offered in the colleges and in the open learning mode. In many ways, Education Grid is complementary to the National Program on Technology Enhanced Learning (NPTEL) that is being executed by the IITs and IISc to develop content in large number of courses for engineering colleges. It provides development and deployment of systems and processes that use NPTEL and other open content for conducting quality education in the colleges. It maintains pedagogically sound and refereed educational resources in identified subjects. Subject specific portals are developed and these portals are governed by subject experts within the programme. This project is supported by the Human Resource Ministry at Indian Institute of Information Technology (IIIT), Kerala. Currently, this program offers open educational resources only in the sciences and engineering sciences (National Knowledge Commission, 2007).

6.4 Medknow Publications

Medknow Publications is the largest publisher in India for academic and scientific biomedical journals. Medknow pioneers in 'fee-less-free' model of open access publishing and provides immediate free access to the electronic editions of the journals. Medknow, with over 40 print + online journals, is probably the largest open access publisher of print journals in the world which does not charge author or author institution for submission, processing or publication of articles.

6.5 e-GyanKosh

It is a national digital repository of Indira Gandhi National Open University (IGNOU). It uses DSpace software for its development. This e-repository of knowledge envisages to store, index,

preserve, distribute and share the digital learning resources for open & distance learing institutes. This repository is available on 24×7 basis. This repository was started with two communities: India and Pan African e-networks. Under the community India, there are sub-communities based on IGNOU's various divisions/courses/schools (Das, 2008).

6.6 UNESCO SALIS e-Learning Portal

This e-portal is developed for awareness raising on information literacy for South Asia. To access this portal, one has to register himself which is offered free. With cooperation of UNESCO, the Society for the Advancement of Library and Information Science (SALIS), India, launched a project 'Interactive e-learning portal' on information literacy competency development skills for South Asia. With the aim to raise awareness and enhance information Literacy competency skill for layman and informational professional, this project was started. The objective of this project is totally based on UNESCO's mandate to bridge the digital divide & UNESCO's vision of knowledge societies. It covers the course on ICT, information literacy, its standards, models, assessments, information service for disabled people, right to information, etc (Das, 2008).

6.7 NCERT Online Textbook

NCERT has initiated the step towards making school textbooks available on the Internet for students and teachers. Through this endeavour a variety of pedagogical possibilities would open up for students and teachers throughout the country. To make available the textbooks to every user freely and to implement the right to know/ education, NCERT has developed this website. Almost all the latest editions of books are available in e-format. This portal navigates to the user to textbook chapter by title/ subject of the book for a particular class (Das, 2008).

6.8 CEC Learning Object Repository

This is an open courseware developed by Consortium for Educational Communication (CEC), New Delhi, with the collaboration of UGC, Educational Multimedia Research Centre, Audio-Visual Research Centre, Vyas Channel. Under this project, various multimedia based television programmes have been developed which are based on syllabus of school, polytechnic and university levels. These are available on various national educational channels.

7. OPEN EDUCATIONAL RESOURCES IN INTERNATIONAL SCENARIO

7.1 MIT Open Course Ware

MIT is known as the leading institute in this area, whereas only around six year back, it had initiated this revolutionary movement. MIT Open CourseWare (OCW) is a web-based publication of virtually all MIT course content. OCW is open and available to the world and is a regular MIT activity. The OCW provides open access to course materials for up to 1,550 MIT courses, representing 34 departments and all five MIT schools. The aim is to include materials from all MIT courses by next year. MIT's OCW began to provide users with open access to class syllabi, lecture notes, course calendars, problem sets and solutions, exams, reading lists, and even a selection of video lectures in 2003. Eleven other US colleges plan to follow MIT's example, and six of those 12 colleges have an online presence (other than MIT). It is just not a MIT degree and MIT does not provide any certificate of complitions. It covers almost all the subject areas such as Aeronautics and Astronautics , Anthropology, Architecture, Biological Engineering , Chemical Engineering, Biology , Chemistry, etc (Bissell, 2007).

7.2 Research Papers in Economics

Research Papers in Economics (RePEc) is a collaborative effort of hundreds of volunteers in 63 countries to enhance the dissemination of research in economics. The heart of this project is a decentralised database of working papers, journal articles, and software components. All RePEc materials are freely available. It holds about 5,80,000 items of interest, over 4,70,000 of which are available online.

7.3 Public Library of Science

Public Library of Science (PLoS) is a nonprofit advocacy and publishing organisation. They publish a growing collection of open access scientific and medical journals whose complete contents are freely available online. Their long-term goals are to create an online "public library of science" containing every scientific and medical paper ever published and to develop the information technologies needed to maximise the value of this resource. This collection features videos produced by PLoS.

7.4 Monterey Institute for Technology and Education

Monterey Institute for Technology and Education (MITE) is an educational nonprofit organisation committed to improving access to education. This library of open educational resources features course materials for seven advanced placement courses from MITE. These high school level materials are available for free download. The various subjects in this are Calculus, Environmental Science, Physics, United States Government, United States History, etc.

7.5 Commonwealth of Learning

Commonwealth of Learning (COL) navigates to the *curriculum and course material development and transfer*, one valuable tool among many contained on this site that will help in publishing efforts (Johnstone, 2005). COL also maintains two online databases of learning content (Learning Object Repository) that provides support to Commonwealth countries free of charge.

7.6 Utah State University Open CourseWare

It is a publication of Utah State University. With believe that all humans' beings are endowed with a capacity to learn, improve, and progress an educational opportunity should be given to them, Utah State open courseware provides a collection of educational material used in formal campus courses, and seeks to provide people around the world with an opportunity to access high quality learning opportunities. Utah State University open courseware assures that no individual who is prepared and who desires the opportunity to advance his or her education is turned away. USU OCW provides an unprecedented degree of free and open access to the knowledge and expertise of our faculty for the benefit of every citizen of the state of Utah and every person in the world.

7.7 E-Science Projects

It is a project of Oxford University devoted to various subjects, e.g., Physics, Engineering, Health, Biological Environment, Grid technology, etc.

7.8 Johns Hopkins School of Public Health (JHSPH) Open CourseWare

This OCW provides access to content of the school's most popular courses in medicine. As challenges to the world's health escalate daily, the School feels a moral imperative to provide equal and open access to information and knowledge about the obstacles to the public's health and their potential solutions (Johnstone, 2005).

7.9 Tufts Open CourseWare

It is part of a new educational movement initiated by MIT that provides free access to course content for everyone online. Tufts' initial course offerings demonstrate the University's strength in the life sciences in addition to its multidisciplinary approach, international perspective and underlying ethic of service to its local, national and international communities. Some of the features of this OCW does not require any registration, does not grant credit, degrees, or certificates, does not provide access to Tufts faculty; however feedback is shared. Some of the well known courses of this OCW are Three-Dimensional Modelling, Animation and Rendering using Blender 3-D Software, patho-physiology of Infectious Diseases, Medicine, Epidemiology and Biostatistics, Zoological Medicine.

7.10 Arxiv.org

It is a project of Cornell University Library and allows open access to 4,74,593 e-prints in Physics, Maths, Computer Science, Quantitative Biology, and Statistics.

7.11 EduCause

EduCause is a nonprofit association whose mission is to advance higher education by promoting the intelligent use of information technology. Get involved in one of their many initiatives, including the EduCause Learning Initiative (ELI) that supports new collegiate learning environments that use IT to improve the quality of teaching and learning, contain or reduce rising costs, and provide greater access to higher education (Johnstone, 2005).

7.12 Global Education and Learning Community

Global Education & Learning Community (GELC) embraces open source and Java developers around the globe who share a passion and commitment to contributing to the development of useful quality code for applications/services that meet the needs of their end users for the development of useful tools, resources, and best practices that help improve education world wide.

7.13 IBM University Initiative

The IBM University Initiative helps faculty and researchers at higher education institutions worldwide use and implement the latest technology into curriculum and research. By joining, one will gain access to software, hardware, training, course materials, and other tools for academic research and collaboration.

7.14 OpenCourse.org

OpenCourse.org hosts virtual communities that develop, evaluate, and use open, non-proprietary learning objects in their discipline. Collaboration among teachers, researchers and students is welcomed with the common purpose of developing open, reusable learning assets (e.g. animations, simulations, models, case studies, etc.). Anyone with an interest in education, collaboration and sharing can join this.

7.15 Multimedia Education Resource for Learning and Teaching Online

Multimedia Education Resource for Learning and Teaching Online (MERLOT) maintains its currency through ongoing and continuing communication with its worldwide supporters in a variety of ways, including the annual MERLOT International Conference, the Journal of Online Learning and Teaching (JOLT), member publications, and news. The website contains leading edge, user-centered, searchable collections of peer reviewed online learning materials for higher education created by registered members and a set of faculty development support services.

7.16 Open Learning Initiative

The Open Learning Initiative (OLI) project, initiated by Carnegie Mellon, offers modules based on crucial elements of instructional design grounded in cognitive theory, formative evaluation for students and faculty, and iterative course improvement based on empirical evidence. Each module undergoes scrutiny by OLI researchers who conduct a variety of studies to examine the effectiveness and usability of various educational innovations. Some courses are open, others are accessible to students with access codes. These courses are disseminated at no cost to individual students and at low cost to institutions.

7.17 Sofia

The Sofia initiative was launched by Foothill-De Anza Community College District in March of 2004. The goal of Sofia is to publish community college-level course content and make it freely accessible on the world wide web to support teaching and learning. Quality materials are identified and selected from the submissions through a peer review process. Materials are reviewed for quality, depth, instructional design, completeness, and use of interactivity and multimedia prior to publication. Sofia provides a vehicle for faculty to share their intellectual assets, gain wide recognition for their contribution to their profession, and play a key role in improving equal access to educational materials beyond their classes. Sofia pilot publishes eight open courses on Creative Typography, Elementary Statistics, Physical Geography, Enterprise Network Security, Introduction to Java Programming, Introduction to Macromedia Flash, Musicianship, Webpage Authoring.

7.18 Sakai

Sakai is an online collaboration and learning environment. It was evolved due to merging by learning management systems among Indiana University, the University of Michigan, Stanford, and MIT. Many users of Sakai deploy it to support teaching and learning, ad hoc group collaboration, support for portfolios and research collaboration. Sakai's development model is called "Community Source" because many of the developers creating Sakai are drawn from the "community" of organizations that have adopted and are using Sakai software. The Sakai software includes many of the features common to course management systems, including document distribution, a gradebook, discussion, live chat, assignment uploads, and online testing.

7.19 Research Channel

In cooperation with the University of Washington, Research Channel is developing a laboratory as a testbed to facilitate collaborative investigations into cutting-edge technologies. Having dedicated engineering spaces and high-performance network facilities including 10 Gigabit Ethernet allows Research Channel to more effectively carry out its work of developing, testing and demonstrating media streaming and networking innovations. Recent projects include multipoint low-latency high-definition videoconferencing and live, high-definition video from the seafloor.

7.20 The Open University

The Open University (OU) is the UK's only university dedicated to distance learning. Through academic research, pedagogic innovation and collaborative partnership, the OU seeks to be a world leader in the design, content and delivery of supported open and distance learning. The latter development process is conducted through the OU's LabSpace, described as "the experimental zone for OpenLearn." LabSpace is designed as a community-led site, primarily for educators, providing a range of online tools to foster the concept of sharing and re-use of materials.

7.21 OER Commons

OER Commons is the first comprehensive open learning network where teachers and professors from pre-K to graduate school can access their colleagues' course materials, share their own, and collaborate on affecting today's classrooms. It uses Web 2.0 features (tags, ratings, comments, reviews, and social networking) to create an online experience that engages educators in sharing their best teaching and learning practices.

7.22 Connexions

The Connexions open educational resource platform at the Rice University aims at publishing "knowledge chunks" or modules that can be combined and linked to produce custom courses. Connexions is not limited to the content produced within its host institution; instead, anyone can submit contributions that will be peer-reviewed after publication. Connexions is internationally focused, interdisciplinary, and grassroots organized. There are now 3531 modules and 182 courses developed by a worldwide community of authors in fields ranging from computer science to music and from mathematics to biodiversity. Most modules are in English, but there are also modules written in Chinese, Italian, Japanese, Portuguese, Spanish, and Thai.

7.23 SHERPA

SHERPA is investigating issues in the future of scholarly communication. It is developing open access institutional repositories in universities to facilitate the rapid and efficient worldwide dissemination of research. The main services of SHERPA are RoMEO (publisher's copyright & archiving policies: one can use this site to find a summary of permission that are normally given as part of each publisher's copyright transfer agreement), JULIET (research funders archiving mandates and guidelines), Open DOAR (worldwide Directory of Open Access Repositories) & SHERPA Search (simple full-text search of UK repositories).

7.24 Directory of Open Access Repositories

Open DOAR is an authoritative directory of academic open access repositories. Each Open DOAR repository has been visited by project staff to check the information that is recorded here. This in-depth approach does not rely on automated analysis and gives a quality-controlled list of repositories. The current directory lists repositories and allows breakdown and selection by a variety of criteria. Open DOAR has also been identified as a key resource for the open access community.

7.25 Virtual University for Small States of the Commonwealth

Virtual University for Small States of the Commonwealth (VUSSC) was established in 2006 through collaboration between education ministers of the Commonwealth Heads of Government and the Commonwealth of Learning (COL), the VUSSC is an effort to foster a collaborative network for educators in small states in various regions around the world. VUSSC uses a wiki platform to bring together "learning content developers" who are committed to the collaborative development and sharing of free content resources for education. The project was launched in August 2006 with a "boot camp," with participants from Antigua & Barbuda, Barbados, Belize, Botswana, Comores, Cyprus, Dominica, the Gambia, Jamaica, Lesotho, Maldives, Malta, Mauritius, Namibia, Papua New Guinea, Samoa, Seychelles, St. Kitts & Nevis, St. Vincent & the Grenadines, Swaziland, Tonga, Trinidad & Tobago, Tuvalu and Vanuatu.

7.26 Open Access News

The Open Access News is regarded as news from open access movement. It is a type of blog which consist of more news than comments. This website is maintained by the Earlham College, Indiana,USA.

7.27 eXe

The eXe project is developing an offline authoring environment to assist teachers and academics in the publishing of web content without the need to become proficient in HTML or XML markup. This open source software project is funded by a grant from the Tertiary Education Commission of New Zealand. eXe supports the definition and modification of pedagogical models through instructional devices, or iDevices. iDevices can be used to package reusable processes or instructional templates. The project is still in early development. The release 0.18 in September 2006 added support for math iDevice and multimedia iDevice, as well as support for Czech, Tagalog, Twi and Ewe languages.

8. CONCLUSION

The open educational resources, open courseware, repositories, and free softwares are demands of the technological era. The price of publishing and printing has been increasing day-by-day, and author as well as publishers is in a hanging situation. Apart from this, the reader also faces the regular price hick and accessibility problems. The concept of open educational resources has emerged as a tool to cope up with this situation. In fact it is the true way of fulfillment of right to information for everyone and also information literacy. One should always keep in mind while developing open educational resources that sustainability should be there. Another aspect of OER should be a transformation from Institutional Repositories to Knowledge Repositories. There is still much to be done to bring awareness and implement standards across the OER movement. One more significant step forward in improving access to OER materials and information will fulfill the right to information and knowledge for all.

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Portals of Open Access Journals: Case Studies

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Abstract: Presents the facility of Open Access Journals (OAJ) available on Internet, which can be accessed by the readers. Gives various definitions, types, advantages and disadvantages, history of OAJ. Lists open access publishers and projects undertaken on OAJ. The facilities available with the Directory of Open Access Journals (DOAJ) and Open J-Gate have been presented as case studies.

Keywords: Open Access Journals (OAJ), Definitions, Types, Advantages and disadvantages, history, Open access publishers, Directory of Open Access Journals (DOAJ) and Open J-Gate.

1. INTRODUCTION

Journals are considered to be the pioneers of Primary sources of information as they comminicate original research findings to the relevant mass. As it is impossible to subscribe to all the Journals of relevance by any Library or indivisual, the latest information genearated, has been denied to the potential users for assimilation, for further generation of new information. In order to reach suitable primary information in the form of Journal articles, without much of financial committment, the concept of Open Access Initiative (OAI) has taken its birth at a meeting organised by Open Society Institute (OSI), at Budapest during 2002. During the deliberations, it has been found that both individuals and organisations who represent researchers, libraries, universities, laboratories, foundations, learned societies, publishers, etc., showed commitment and supported the activity of Open Access Initiative. An amount of US $ 3 million came as fund from George Soros, the founder of OSI. Due to the Open Access Initiative movement, large number of both popular and scholarly peer-reviewed Journals driven into open access domain.

1.1 History of Open Access Journals

During 1998, the ***Journal of Medical Internet Research (JMIR)*** was created, as one of the first Open Access Journals in Medicine, and published its first issue in the year 1998. It was created by researchers for researchers, without involvement of any commercial publishers, and without practically no budget. JMIR remains a highly successful OAJ and to date is perhaps one of the few Open Access Journals which is not making a loss and independent on external grants *(d)*.

1.2 Open Access Publishers

A selected list of Open Access Publishers is given below:

a. Bentham Open Access.
b. BioMed Central.
c. Hindawi (98 full open access STM journals).
d. Indian Academay of Sciences.
e. Ivyspring International Publisher.
f. Libertas Academica (60+ fully open access journals, mainly biological sciences and clinical medicine).

g. Medknow Publications (Publishers of Biomedical Journal from India).
h. MDPI (Molecular Diversity Preservation International (MDPI), Basel, Switzerland) (Some journal content only open access).
i. Public Library of Science.
j. Scholarly Exchange.
k. Istituto Italiano di Antropologia.

1.3 Major Projects to Provide Open Access Journals

The major projects undertaken to provide Open Access Journals are indicated below *(b):*

During 1990s, following 3 Journals are pioneers in open access publishing, in the biomedical domain–

a. Biomedical Journal.
b. Journal of Medical Internet Research.
c. Medscape.

BioMed Central, a for-profit publisher published first article in the year 2000. At a later date, the Public Library of Sciences, provided open access to the following Journals:

a. PLoS Biology (2003).
b. PLoS Medicine (2004).
c. PLoS One (2006).

2. DEFINITIONS

Although there are number of definitions for Open Access Journals, only a few definitions have been presented below:

a. Open Access Journals are scholarly Journals that are available to the readers without financial or other barrier other than access to the Internet itself *(d).*
b. Open Access Journals are having no financial or other barrier other than access to the Internet itself *(d).*
c. Open Access Journals are those which are accessible free with or without registration *(c).*

3. TYPES

There have been a number of modifications to the definitions in order to increase range of requirement and to make it more flexible. Some Journals have every article open access. But, some Journals have a limitation on the commercial reuse of articles, thus disqualifying them from open access concept. However, in a broader sense, all the Open Access Journals can be classified under the following 2 types:

Table 3.1 By Nature of Journals

S.N.	Nature of Journals	Nomenclature of Journals
1	Journals entirely open access	Open Access Journals
2	Journals with research articles open access	Open Access Journals
3	Journals with some research articles open access	Hybrid Open Access Journals
4	Journals with some research articles open access and others delayed access	Hybrid Open Access Journals
5	Journals with delayed open access	Delayed Open Access Journals
6	Journals permitting self-archiving of articles	Journals permitting self-archiving for the last

3.2 By Financing of Journals

In practice, it has been observed that all the Journals are not Open Access Journals. Some Journals are subscribed, and some require payment either by the author or others on behalf of the author. Hence, based on the financial criteria, Open Access Journals can be classified as mentioned below:

S.N.	*Nature of Journals*	*Financing Methodology*
1	Fee-based Open Access Journals	(a) Requires payment by the author or behalf of author (b) Money might come from the author or more often from the author's research grant or employer (c) In cases of financial hardship, many Journals will waive all or part of the fee
2	No-fee Open Access Journals	(a) They will have direct or indirect subsidies from institutions like universities, laboratories, research centres, libraries, hospitals, museums, learned societies, foundations, goverment agencies, etc. (b) Some will have revenue from a separate line of Non-Open Access publishers(c) Some will have revenue from advertising, auxiliary services, membership fee, endowments, reprints, etc.

4. OBJECTIVES

Major Objectives of the study are as follows:

a. To identify the Open Access Portals available on Internet.

b. To identify number of Open Access Journals available through Portals on different subject fields.

c. To identify free and subscription based Portals and briefing on 2 Portals as case studies.

d. To facilitate staff members to browse the Portals for their requirements.

5. METHODOLOGY

Case study method has been adopted for presentation.

6. ADVANTAGES AND DISADVANTAGES OF OPEN ACCESS JOURNALS

6.1 Advantages

a. The primary advantage of Open Access is that the content is available to users everywhere regardless of affiliation with a subscribing library.

b. Authors of such articles will see their papers more read, more cited, and better integrated in to the structure of sciences.

c. Academic researchers will have access to the relevant Journals where the institutions can not afford to the Journals or the Journal is out of scope.

d. Researchers will have access to the relevant Journals where their Library can not afford for the Journals.

e. It is a way of advertisement *(a)*.

f. General readers or general public will have access to the interested subject matter or scientific research.

g. Tax payers will have an opportunity to see the results of research they pay for.

6.2 Disadvantages

a. In case of fee-based Open Access Journals, authors either need to have a sponsorer to pay on their behalf, or personally pay publication fee.

b. Some feel that open access is unnecessary.

c. Some feel that open access is too impractical to implement.

7. CASE STUDIES

As on today, following Portals / Directories of Open Access Journals have been identified.

a. Die Elektronische Zeitschriftenbibliothek (English version) (EZB).

b. Directory of Open Access Journals (DOAJ).

c. Genamics Journal Seek.

d. Jan Szezepanski's Lists of Open Access Journals.

e. List of Open Access Journals with Wikipedia Entries.

f. LivRe.

g. Open J-Gate.

h. University of Nevada Collection of Free Electronic Journals.

Out of the above Portals / Directories, following two have been considered for case study.

a. Directory of Open Access Journals (DOAJ).

b. Open J-Gate (OJ).

7.1 Directory of Open Access Journals (DOAJ)

The Directory of Open Access Journals (DOAJ) was developed by Lund University. This facility covers free, full text, quality controlled scientific and scholarly Journals. It aims to cover all subjects and languages. At present, DOAJ contains 3,569 Journals and 1,99,325 articles. Out of which, about 1,225 Journals are searchable at article level *(b)*. The subject coverage and number of Journals which represents under each of the subjects, and number of Journals with starting alphabet are represented below.

7.1.1 Subjectwise List

S.N.	Subjects	No. of Journals Covered
1	Agriculture & Food Sciences	205
2	Arts and Architecture	95
3	Biology and Life Sciences	384
4	Business and Economics	141
5	Chemistry	83
6	Earth and Environmental Sciences	286
7	General Works	51
8	Health Sciences	1070
9	History and Archaeology	135
10	Languages and Literatures	228
11	Law and Political Science	161
12	Mathematics and Statistics	150
13	Phylosophy and Religion	141
14	Physics and Astronomy	84
15	Science (General)	41
16	Social Sciences	835
17	Technology and Engineering	340
	Grand Total:	**4,430**

Source: http://www.doaj.org *(accessed on 18 th August 2008)*

7.1.2 Alphabetwise List

S.N.	Journals Starting with Alphabet	No. of Journals
1	A	356
2	B	208
3	C	255
4	D	70
5	E	260
6	F	53
7	G	69
8	H	65
9	I	396
10	J	404
11	K	37
12	L	64
13	M	141
14	N	88
15	O	141
16	P	192
17	Q	11
18	R	368
19	S	167

S.N.	Journals Starting with Alphabet	No. of Journals
20	T	128
21	U	27
22	V	21
23	W	28
24	X	0
25	Y	3
26	Z	13
	Total:	3,565

Source: http://www.doaj.org *(accessed on 18 th August 2008)*

7.2 Open J-GATE (OJ)

The Open J-Gate (OJ) was started by Informatics (India) Limited, Bangalore and developed in to a largest database for OA Journals. It was started as a database tool and E-Journal gateway for searching and accessing articles online available Journals. Currently, J-Gate indexes articles from more than 16,000 English language journals, out of which over 10,000 are in scholarly domain. As on today, J-Gate covers 4,230 OA Journals covering both scholarly and popular Journals from 2001 onwards.

7.2.1 Salient Features

The salient features of OJ are mentioned below:

a. It is a subscription product, which restricts access to OA Journals.

b. Indexes articles from 4,230 academic, research and industry Journals in English language.

c. The number of 1 million is increasing by adding more than 3,00,000 new articles being added every year. Full text links are regularly validated.

d. Updated almost daily.

e. Journals are classified in a hierarchical system to provide for better relevancy in search results.

f. Users can browse Table of Contents both from archieve as well as current titles.

g. Database allows Quick search, Advanced search and Browse by Journal.

7.2.2 Subject Coverage

The broad subjects covered under J-Gate and approximate number of Journals covered under each of the subjects are shown below:

S.N.	Subjects	No. of Journals
1	Agriculture and Biological Sciences	618
2	Art and Humanities	821
3	Basic Sciences	1,151
4	Biomedical Sciences	1,480
5	Engineering and Technology	1,228
6	Library and Information Science	71
7	Social and Management Sciences	1,242
	Total:	**6,611**

Source: *DESIDOC J of Library and Information Technology. Vol 28, No 1, Jan 2008*

7.2.3 Browsing of Table of Contents

By using J-Gate facility, users can browse the Table of Contents (TOC) of latest issues and also back issues. Statistics of available Journals in TOC and Articles for browsing are shown below:

S.N.	Subject	No. of Journals in TOC	No. of Articles
1	Basic Sciences	6,740	6,679,047
2	Engineering and Technology	5,332	4,206,294
3	Social and Management Sciences	5,796	2,599,099
4	Arts and Humanities	3,169	980,568
5	Agricultural and Biological Sciences	3,580	3,803,473
6	Biomedical Sciences	6,816	6,103,872
7	Library and Information Science	219	63,562
	Total:	**31,652**	**24,435,915**

Source: DESIDOC J of Library and Information Technology. Vol 28, No 1, Jan 2008

8. ANALYSIS AND INTERPRETATIONS

Thorough study of DOAJ and OJ, following analysis and interpretations have been drawn:

S.N.	Facilities	DOAJ	OJ
1	Type of Portal	Free	Subscription based
2	Searchable up to	Article level free-of-cost	Abstract level free-of-cost
3	No. of Subject areas covered	8	7
4	No. of Journals listed	3,569	4,350
5	Covering of Popular and Trade-press Journals	No	Yes
6	Peer-reviewed Journals	3,569	2,200
7	Journals from which articles are indexed	1,225	4,350
8	No. of Articles indexed	199,325	1,232,000

With help of above mentioned data, following interpretations are made:

a. Both DOAJ and OJ are OA Portals. DOAJ is a free Portal and OJ is a Subscription based one.

b. Subject areas covered are almost same in both Portals except addition of Library and Information Science in OJ.

c. Number of Journals listed are slightly high in case of OJ when compare to DOAJ.

d. Peer-reviewed Journals are more in DOAJ when compare to OJ.

e. Number of Journals covered for indexing are very high in OJ when compare to DOAJ.

f. Number of Articles indexed are very high in OJ when compare to DOAJ.

g. Popular and Trade-press Journals are covered by OJ but not by DOAJ.

In view of the above, it is suggested that any Library for that matter, may start using DOAJ at first, as it is a free Portal. After utilising it fully, then may consider to subscribe to Portals such as OJ, if financial provisions permit for the same.

9. ADOPTION AT S.C.S.V.M.V. UNIVERSITY

After thorough examination of both the Portals, i.e., DOAJ and OJ, the International Library located at Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya University, Enathur, Kanchipuram, Tamilnadu, made an attempt to utilise the DOAJ Portal for full text articles. The search methodology has been explained to the Library Committee members, drawn from various departments and details of the Portal including site address have been provided to them, to utilise the Portal to fullest extent. After using the Portal, the staff members expressed their satisfaction over the coverage of full text articles in DOAJ on their subject fields. Efforts will be made to subscribe to Portals such as OJ at a later date.

10. CONCLUSION

It is impossible for any individual or any Library to subscribe to all the Journals relevant to their subject interest, due to mashrooming number of Journals and their high cost. Hence, it is obvious to find alternative sources for Journals ahich are free or cost effective. To this effect, the latest development of Open Access Source Journals facility seems to be an alternative, which may satisfy the interests of the users, atleast to some extent. All the Libraries should tap the potential of all the Open Sources of Journals to the optimum extent. Afterwards, may go for subscribing to other relevant Journals which the Open Sources does not cover.

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Role of libraries in Open Archive Initiatives: A Study

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1. INTRODUCTION

The advent of the internet is enabled researchers and academics to recognize that information and communication technologies gave them efficient ways to share results, to combat the rise in journal costs fast outpacing libraries' ability to afford them (serials crisis), to overcome the barriers raised by the full transfer of intellectual property rights from author to publisher, and to improve on the hitherto slow turnaround of traditional publishing. The essence of the open archives approach is to enable access to Web-accessible material through interoperable repositories for metadata sharing, publishing and archiving.

The Open Archives Initiative (OAI) develops and promotes interoperability solution that aim to facilitate the efficient dissemination of research content. Open archiving aims to facilitate dissemination of papers (pre-prints and post-prints) into networked accessible repositories over the Internet.

The name *Open Archives Initiative* reflects the origins of the OAI in the E-Prints community where the term *archive* is generally accepted as a synonym for a repository of scholarly papers. Members of the archiving profession have justifiably noted the strict definition of an "archive" within their domain; with implications for preservation of long-term value, statutory authorization and institutional policy. The OAI uses the term "archive" in a broader sense: as a repository for stored information. Language and terms are never unambiguous and uncontroversial and the OAI respectfully requests the indulgence of the archiving community with this less constrained use of "archive".

2. HISTORICAL BACKGROUND AND CONTEXT

The World Wide Web (WWW) is frequently thought of as the technology that revolutionized computer networking by effectively breaking down the barriers between the providers of content and the users of that content. The underlying idea was not particularly a novel one since the hypertext community has been investigating such avenues for decades. However, it was backed up by free, easy to utilize software that satisfied a need in the rapidly advancing networked community, and so it was immensely successful.

The WWW broke down a major barrier in making information freely accessible, but it also created information management problems for which simple solutions did not exist. One such problem is that

of persistence: how can we guarantee that a digital object on the WWW will always exist? Another question has to do with authority: how much trust can we place in the systems. Smaller DLs were not prepared to make the investment in a complex protocol for interoperability, especially since the rewards were not immediately tangible.

In October 1999, a meeting of representatives of various existing archives was held in Santa Fe, New Mexico, USA, to address the concern that interoperability was beyond the reach of most DL systems. Delegates at this meeting included representatives of the Association of Research Libraries, Coalition for Networked Information, Council on Library and Information Resources, Digital Library Federation, Library of Congress, Networked Digital Library of Theses and Dissertations (NDLTD), Scholarly Publishing and Academic Resources Coalition, and various universities and research institutes. The result of this meeting, the Santa Fe Convention (van de Sompel and Lagoze, 2000), was an agreement among the parties to subscribe to a common standard for interoperability based on transfer of metadata from repositories using a minimal protocol and leveraging existing technology to achieve this.

The origin of OAI can be traced back to the efforts to increase interoperability among the eprint/ pre-print servers that hosted scientific and technical papers . A number of factors led to the development of the pre-print archives most important of which was the rising cost of journals. Scholars and researchers would deposit their articles and papers into these servers, which allow for the dissemination of information among the scholarly community much more rapidly than through traditional print journals.

The number of e-print/pre-print repositories was growing steadily in the nineties. This growth created an information overload and some other problems, which can be summarized as:

- The end-users/scholars may not be able to know the existence of a repository.
- Overlapping of coverage in terms of subjects.
- Multi-disciplinary nature of subjects needed the documents to be kept at a number of repositories.
- Discipline-specific and institution-specific archives created duplication efforts.
- The end-users/scholars had to search individual repositories to get documents of his interest.
- Also, it was undesirable to require scholars to deposit their work in multiple repositories.

3. OPEN ARCHIVES INITIATIVES

The origins of the OAI lie in increasing interest in alternatives to the traditional scholarly publishing paradigm. An increasing number of scholarly disciplines, especially those in the so-called "hard science" (e.g., physics, computer science, life sciences), are producing results at an increasingly rapid pace. This velocity of change demands; mechanisms for reporting results with lower latency times than that ones experienced in the established journal system. The ubiquity of high-speed networks and personal computing has created further consumer demand for use of the Web for delivery of research results.

Many communities are beginning to or potentially could benefit from the open archives approach. The Internet and the growing mass of material in digital format have broadened the potential clientele of many repositories of information. Material can be accessed more widely and also exploited for purposes different from those that originally motivated the creation of the repositories.

4. OAI TOOLS

Internet age has brought revolutionary changes in the publishing industry, upon which libraries rely so heavily for their resources. Open access is free, immediate, permanent online access to the full text of research articles for anyone, web wide. Open access can be provided by various means. A researcher can place a copy of each article in an open archive/repository, Open Access Journals, Personal or Departmental website.

There are mainly two tools for open archives:

- Open Archives
- Open Access Journals

A) OPEN ARCHIVES

Open archives or repositories simply make contents freely available to the world. They may contain un-refereed preprints, refereed post-prints, or both. Archives may belong to institutions, such as universities and laboratories, or disciplines, such as physics and economics.

Types of Open Archives:

There are various types of open archives as per the nature and scope of the archives. Leslie Chan and Barbara Kirshop (2001) have classified the open archives into four broad groups.

- Individual Archives or Self-Archives
- Institutional Archives
- Discipline based Archives
- Other Specialty Archives

B) OPEN ACCESS JOURNALS

Every research institution in the world suffers from intolerable access limitations, no matter how wealthy. Not only must libraries cope by canceling subscriptions and cutting into their book budgets, but also researchers must do without access to some of the journals critical to their research. The serials pricing crisis is now in its fourth decade. Prices limit access, and intolerable prices limit access intolerably.

The quality of scholarly journals is a function of the quality of their editors, editorial boards, and referees, which in turn affect the quality of the authors who submit articles to them. Open-access journals can have exactly the same quality controls working for them that traditional journals have.

5. OAJ IS A SOLUTION ON TWO CRISIS

1 Both the pricing and permission crises can be solved at one stroke by open access.

2 Open access is definitely attainable for scientific and scholarly journal literature, the body of literature primarily affected by the pricing and permission crises. It has already been attained for a growing portion of this literature.

6. DEVELOPING COUNTRIES AND OAI

Against background the Internet emerged in 1990 as a kind of miracles it became physically and economically viable to connect the authors, who wants to give away their works, with readers who want to read and build on it. This new form of distribution on-line, free of charge and free of needless licensing restrictions is now called open access or open archives.

Although the World Wide Web is less than a decade old, it already has had a profound impact on scientific publishing and scholarly communication. In particular, open standards and low-cost networking tools are opening many possibilities for reducing and even eliminating entirely the cost barriers to scientific publications. One development that has great potential value for poorly resourced countries is "open archiving" or the deposition of scholarly research papers into networked servers accessible over the Internet.

Archiving initiatives are of great importance to all scientists, students, researchers, academicians, librarians, but particularly to those in the developing world. Free access to research information from the developed countries has incalculable benefits for local research. A key benefit for developing country scientists is that participation in research could take place without any further delay. The academic community in poorer countries can take advantage of servers any where in the world. OAI Services without the need to set up their own independent server for maintaining them.

The OAI is widely consulting with institutions and library communities in refining standards and protocols that serve the researchers needs. New open archives are becoming established in many universities and libraries that will ultimately become part of the network of archives accessible to all. Open source and free software have been developed and are currently being improved for used by institutions wishing to set up their own archives in an interoperable way.

7. INDIA AND OAI

OAI have not yet started in India at a large scale, but now people have been aware about its benefits, and people like Prof. T.B. Rajasekar, Prof. Arunachalam have always been advocating the essence to start the OAI compliant e-print archives in India.

8. MERITS OF OAI

- Lowering impact barriers:
- Ease of access & rapid dissemination
- OAI functionality & Value added services
- Raising the profile of the institution
- Free access & global participation
- Improved usability impact at institutional & national level.
- Improved management of institutional intellectual property.
- Contribute to institutional Knowledge management.

9. BENEFICIARIES OF OAI

An OAI server is output of interests of many cross-sections of people in the society and it is beneficial to all of then in one-way or other.

- Authors: OAI enlarges their audience and increase the visibility impact of their work.
- Readers: OAI gives a barrier free access to literature they need.
- Teacher and Students: OAI eliminates the need for permission to reproduce and distribute content.
- Journals and Publishers: OAI makes their articles more visible, discoverable, retrievable and useful and attracts submission and advertising.
- Funding agencies: Increases their returns to their investment in research.
- Government: Promotes democracy by sharing information as rapidly and widely as possible.
- Libraries: OAI solve pricing crisis for scholarly journals and permission crises.
- Citizens: OAI gives them access to peer reviewed research.

10. LIMITATIONS OF OAI

- Filtering and censorship barrier
- Language barrier
- Connectivity barrier & lacking interoperability
- Different terminology, language
- Different access strategies, copyright regulation & interface

11. WHAT WE CAN DO?

After looking for OAI benefits and limitation, now it's very important to understand what we can do for the OAI development in our country.

11.1 Faculty/Researcher/Author/Students

- Submit your research articles to OAJ, when there are appropriate OAJ in your field.
- Deposit your Pre-prints and Post prints in open Access, OAI-compliant archive.

11.2 Journals and Publishers

- Let authors retain copyright ask only for the right of first print and electronic publications.
- Let authors archive data their preprint and their post-print.
- Reduce costs by using open-access journals management software, like open journal systems or DpubS or high-quality, low-cost services like ICAAP.

11.3 Learned Societies

- Let authors retain copyright, let them keep their preprint online after you publish the post-print, and allow post-print archiving.
- Adopt the policy that all conferences sponsored by your society will provide open access to their proceedings, even if you also choose to publish them in a priced journal or book.

11.4 Foundations

- Put on open access condition on research grants. By accepting a grant, the grantee agrees to provide open access to any publications that results from the funded research.
- Give grants to universities to help, create institutional archives and to provide the necessary support for filling and maintaining.

12. ROLE OF LIBRARY PROFESSIONALS

Information professionals have to be aware of the (r)evolution taking place in scholarly communication and influence it as much as possible, for the benefit of their own organizations and global scientific and scholarly communities. They must become skilled in the use of new applications and should be looking to take advantage of the new opportunities created by the ready availability of open access resources.

Libraries are most natural allies of researchers in the self-archiving to free the referred journal literature. Maintaining the open archives, and facilitating the all-important start-up wave of self-archiving will be a critical role for libraries to play. Trained library staff should help in showing the faculty how to self-archive papers in the university open archive. The library staff should also offer to help in doing "proxy" self-archiving, on behalf of authors who feel that they are personally unable (too busy or technically incapable) to self-archive. The librarians, collaborating with web system staff, should be involved in ensuring the proper maintenance, backup, mirroring, upgrading, and migration that ensures the proper preservation of the institutional open archives. Mirroring and migration should be handled in collaboration with counterparts at all other institutions supporting OAI-compliant open archives.

i. Launch an open access, OAI-compliant institutional open archive.
ii. Configure your archive to facilitate crawling by Google and other search engines.
iii. Help faculty deposit their research articles in the institutional archive.
iv. Include OAJ in the library catalog.
v. Need to create awareness about OAJ in their institution.
vi. Offer to assure the long-term preservation of some specific body of OA content.
vii. Undertake digitization, access and preservation projects not only for faculty, but for local groups.
viii. Negotiate with venders of period electronic content for full access by walk-in-patrons.
ix. Coordinate programmers to advise and support scholars on copyright issues and how best to negotiate the right to self-archive.
x. Support potential authors in their electronic publishing activities.
xi. Communication skills are an essential of formal and informal liaison with academics. In many institutions, librarians are assisting academics to self-deposit their research output into academic. In many institutional repositories.

13. CONCLUSION

Open Archives Initiatives are still in their infancy, having only started to appear few years ago. Yet despite the explosion of the www, only a minority of authors and in very few fields (mostly physics, mathematics, computer science, medical science, life science) is using this channel for their scholarly communication. OAI still enable to reach all over the world because of various social, ethical and legal issues.

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Change Management in Digital Library: An Overview

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Abstract: Digital libraries are in a process of fundamental change brought about by radical changes in technology. The paper presents the meaning of digital library. Explains the concept of change manage-ment; strategies for change management. The paper looks at why change management in digital library? Discuss why library staffs resist change?

Keywords: Digital Libraries; Change Management

1. INTRODUCTION

A digital is an organized collection of electronic resources. Digital library is a very complex and dynamic entity. It has brought phenomenal change in the information collection, preservation and dissemination scene of the world. It is complex entity because it completely based on ICT systems and the concept is recent origin. Its main aim is to provide ready access to acquire the required information at aright time to the right user at right information. The collection of digital library are not limited to document surrogates they extend to digital artifacts that cannot be represented or distributed in printed formats. Therefore, digital library is not a single unit, but a complex of multi unit provides instant access to all information, for all sectors of society, from anywhere in the world. Therefore, in this context, the digital library must cope up with the changing technology, information seeking behaviour of its user, user needs etc. The day has come to adopt change management on par with information management in the library (Vijaykumar & Sekar,2008)

2. THE CONCEPT OF CHANGE MANAGEMENT

In digital libraries, continue change management is needed in order to survive. But the degree, nature, and difficulty of the needed changes are frequently not fully understood. As a result, introducing change is very difficult. What is needed is a way to manage that meets modern user needs, which has driven libraries to adopt change management. A common perception is that this form of improvement is a formula that people can learn to use without hav-ing to change the libraries or the way it is managed. They think that it can be lay-ered onto a traditional functional organization. The libraries continu-ally reach for higher performance levels by creating a culture that continuously improves relationships with its staff and users. Reaching this position requires several basic changes in how libraries operate. They may be (a) Changing from managing to leading, (b) Shifting library relationships from individuals to a team process.

It is the prime responsibility of top management to ensure the health and survival of a parent organization. The libraries that are not functioning effectively that are not competing management must identify what has to be done and then adopt the lead-ership role to induce the necessary changes. This has proved to be a difficult task mainly the result of human behavior. For example, industrial management has been autocratic since the industrial revolution a hundred years ago. It even adopted

the military organization structure as its model throughout this period; new managers were selected for their authoritarian capabilities, among other things, and then further trained to be like those in charge. With lack of success, managers were blamed and they were replaced (Cartin, 2008).

Historically, parent organization has avoided direct involvement in change management for quality in library. Instead, it delegates it, often vaguely, to some subordinate staff. It has now become evident that attaining quality leadership requires that parent organisation personally take charge of the quality initiative. In every activity of the library the upper managers of parent organization took charge. They did not just make speeches and then delegate all else to subordinates. Instead they carried out active roles to:-

- Establish the quality goals of the library;
- Provide the resources to their library;
- Provide die quality-oriented training to the library staff;
- Stimulate quality improvement in the library day to day activities;
- Review progress of the library activities and
- Give recognition to library staff

3. STRATEGIES FOR CHANGE MANAGEMENT

Change management strategies generally focus on a combination of library staff, processes and technology. Ultimately the goal of a change is to alter the existing condition of a library. Specifically, the librarians seeks to change how the library is responding to its users, to competitors, to new technologies, etc

Convince management that the present state is unacceptable and that a change is necessary. Clearly describe why—on both an intellectual level and on an emotional level

Describe a clear picture of what the desired state looks like.

- As possible, let Management know what will be different for them and how they can benefit by change
- Allow time for management to adjust to the change,
- Have a clear plan for getting from the present state to the desired state. Share information on the plan.
- Get management staff involved in planning the change. Leave room for choices.
- Implement the plan, and then monitor progress against the plan.
- Be clear about the expectations and requirements in the new state.
- Communicate updates about progress. Allow time for users to have discussions with library staff and parent organization administrative staff.
- Lead by example; change management needs to model the desired state.
- Enable library staff to perform well in the desired state; provide training, coaching, etc.
- Try to make it a win-win situation; avoid creating losers.

4. WHY CHANGE MANAGEMENT?

Change management encompassing the move to digital libraries are substantial and involve both human and resource factors. Moreover, the changes are often difficult to predict, dependant as they are on the ever-changing nature of technology.

At the economic level, digital libraries in developed services are already aware of the problems, which derive from the need to maintain dual subscriptions to both electronic and traditional materials during the change management. Users are often disinclined to make radical changes in their use of materials and resent electronic formats being imposed upon them; they also frequently require connectivity, machinery or skills to make best use of what is available. Moreover spiraling journal prices add to the extra cost burden so that any potential savings in labour the library might feel would be brought about by electronic delivery, are often difficult to realise. Perhaps more positively has been the growth of consortial purchasing of bundled services which, as a consequence, should show some economy in budgets and also serve to democratize resource provision, especially for smaller institutions which can 'piggy back' on larger organisations resource requirements (Akeroyd, 2000). Therefore, change management is required for :-

Reliability	–	the ability to provide what was promised, dependably and accurately
Assurance	–	the knowledge and courtesy of library staff, and their ability to convey trust and confidence
Tangibles	–	facilities and equipment, and the appearance of personnel
Empathy	–	the degree of caring and individual attention provided to library users
Responsiveness	–	the willingness to help users and provide prompt service

5. WHY LIBRARIAN AND HIS STAFF RESIST CHANGE

There are many reasons why librarian and his staff resist change. They are:-

5.1 Lack of communication

Change often does not take off because the library personnel, who are to carry it out, do not know what they are supposed to do. The librarian has not communicated well the detailed aspects of the change. The library staff may only understand the change in broad terms and not in practical terms.

5.2 Procedure

Change may fall through because the library staff does not know how it should go about it. They may lack the knowledge, skills and experience to implement the proposed change. Often, librarians may not be able to perceive the shortcomings in this area because the staff does not feel comfortable disclosing its lack of knowledge or skills. Thus, it may go about change in the wrong way, as it does not possess the right skills or knowledge. With dismal results from the initial implementation of change, they may get frustrated and decide to go back to what they had been doing.

5.3 Goal Oriented

Another reason why the library staff may resist change is that they do not know why they should undertake a specific change. They may not be convinced about the purpose of the change or they may not see the benefits of the change. Hence, they would not commit themselves to the change and cooperate to ensure its success.

5.4 Involvement of Parties

Resistance may also arise if library staffs are not clear about who are specifically involved in the change. Too many library staff involved in the change without a clear definition of their roles will bring confusion and frustration. It leads to conflicts and affects the results of change programmes.

5.5 Proper support

Commitment to change from the top is critical. Many well-planned change programmes have failed because librarians who plan the change do not follow up with the necessary support. Support in terms of resources, know how, moral support and motivation is needed to ensure smooth implementation of change.

5.6 Lack of courage

Change programmes often fail not because of lack of skills but because of absence of courage to implement the change. Library staff may feel that it is risky to undertake any change.

5.7 Poor motivation

This is a powerful resistance to change. There are more change programmes that failed due to lack of motivation rather than the lack of know-how. A clear and outright declaration on how library staffs are going to be rewarded if they achieve successful results from change would go a long way.

To counter all these factors and implement the change successfully, as a librarian, one need to create a compelling vision to inspire library staff to change; a vision that is inspiring and dynamic. The vision should incite a sense of challenge and a deep sense of pride for library staff to achieve it. It should create possibilities for a dynamic future where everyone has a stake. It should provide a clear picture of what the future will be like once this vision is achieved.

6. CHANGING TO USER'S NEED

It can begin by answering these five questions:

- What are the user needs and expectations, and which matter most to them?
- How well are we meeting those needs and expectations?
- How well are similar libraries meeting them? What are they doing?
- How can we go beyond the minimum and truly delight them?
- Does the library routinely determine and satisfy their user needs and expectations?

An approach to defining user needs and expectations is to focus on answering these questions:

- Do we have a practice of doing user's information need analysis, that is, what's new, who is accessing what, where?
- Do we get data from users and others, analyze it, and act on results?
- Do we do an analysis of other similar library's products; services, and practices?
- Do we use benchmarking of our processes to find the best?

7. CONCLUSION

Nothing can better emphasize the need for change. Every library needs to change with time; failing which, it stands the risk of being pushed into oblivion and being labeled as obsolete by the more

enterprising competitors in the world. Change could be effected in the overall policy and procedure, in the infrastructure, in the structuring of staff, etc. Whatever the parameter being touched, the digital library will surely face a challenge while implementing the said change. To implement successful change, as a librarian, one need an overall leadership force that is greater than the combined force of resistance. Librarians of digital library need to use their leadership skills to address the resistance.

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Comparative Analysis of Semantic Digital Library Software

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Abstract: Today we are living in the information age and society can be labeled as information society. Knowledge, a predominant element, pervades and dominates in the day-to-day activities in information society. The information environment is greatly changing throughout the world. Libraries are an effective source of information to be shared by people of all kinds. Present rapid development in communication system and recent innovation in technology witnessed as changing emphasis in the role of information and management. The new technologies have facilitated the transformation of data into digital formats. The availability and use of digital libraries is gradually becoming the norm for the provision of literature and information in all the fields and research. Digital Libraries are catering to information services interacting with online databases of journals and other resources Digital Library are important in creating, indexing and retrieving the various forms of digital resources. There are many different types of Semantic Digital library Software which play an important role. The papers discuss about what is digital libraries and its need, an overview on Semantic Digital Library, its purpose, its components and a comparative analysis of Semantic Digital Library Software: JeromeDL, Bricks, and Fedora.

Key words: Digital Libraries, Semantic Digital Library Software

1. INTRODUCTION

In this era of Information Technology, it is only natural that all kinds of institutions are being affected by technological development. Libraries are no exception to this. The end users approach to meeting information needs is also rapidly getting transformed. They are more interested in receiving the information at their workplace rather than going to reference desk or to a library each time. Libraries have sought to apply and utilize the available technology to enhance their reach and value. Digital Libraries play an important role. The term "Digital Libraries has a variety of potential meanings, ranging from a digitized collection of material that one might find in a traditional library to the collection of all digital information along with the services that make the information useful to all possible users. A digital library is much more than just the collection of material in its repositories. It provides variety of services to its users.[2] Libraries have been always been a source of organized knowledge for various application areas, teaching, research, decision-making, etc.Digital libraries deliver similar services in digital context, e.g. e-learning. Systems like JeromeDL, Bricks, Fedora, which adapts semantic web and social networking technologies to knowledge organization systems in digital libraries domain, which are the corners stones of the future Internet. They not only deliver high quality knowledge, but also provide wide range of search and browsing services, together with others, which are based on social interactions. The study is made about what is digital libraries and why it is necessary, an overview on Semantic Digital Library, its purpose, its components and a comparative analysis of Semantic Digital Library Software: JeromeDL, Bricks, and Fedora.

2. WHAT IS DIGITAL LIBRARY?

The digital Library is a library in which collections are stored in digital formats (as opposed to print, microform, or other media) and accessible by computers. The digital content may be stored locally, or accessed remotely via computer networks the term digital libraries were first made popular by the NSF/DARPA/NASA Digital Libraries Initiative in 1994. It also refers to a system or a set of

applications whose function is chiefly to extend electronic access to material available in a conventional library to remote users.

According to Wikipedia "A digital library is a library in which collections are stored in digital formats (as opposed to print, microform, or other media) and accessible by computers. The digital content may be stored locally, or accessed remotely via computer networks. A digital library is a type of information retrieval system. [3]

2.1 WHY DIGITAL LIBRARY?

Some of the factors that necessitate design and development of digital libraries are as follows?

- Digital Resources have come to be regarded as an increasingly important resource type. This is a direct result of the web being used extensively for scholarly publishing as well as for publishing resources of value in commerce and government. Digital libraries serve as portals for the huge reservoir of information.
- Digital Libraries have role in preservation/archiving information. Digital library presents opportunities for long term preservation of resources.
- The rising costs of acquisition and subscription to journals have forced librarians to look for other ways to make information available.

3. WHAT IS SEMANTIC DIGITAL LIBRARY?

Semantic web is an evolving concept, a philosophy and can be seen as an extension of the present World Wide Web. What will characterize semantic web will be that web content can be expressed not only in natural language, but also in a form that can be understood, interpreted and used by software agent. This will facilitate finding, sharing and integrating information on the web more easily. The idea is to develop technologies that make the information more meaningful for the machine to process, so as to support more effective retrieval of information. Some elements of the semantic web are expressed in Resource Description Framework (RDF); a variety of data interchange formats e.g. RDF/XML, N3, Turtle, N-Triples, and notations such as RDF Schema (RDFS) and the web Ontology Language (OWL).[6] The Semantic digital library is an attempt to restore collaborative approach to sharing knowledge. The semantic services enhance search and browsing features, interconnect different systems and exchange data, while social services let people benefit from expertise of others; together, they improve knowledge sharing in a digital library. The research on semantic digital libraries initiates the work on how to semantically interconnect various knowledge organization systems; the role of the communities and social relations in this context is the subject of current research on folksonomies and semantic wikipedia. Both research tracks delivered important results; recently they were combined into one research agenda. These research activities have been put into practice resulting in solutions like JeromeDL, BRICKS are Semantic Digital Library

Semantic digital libraries help; [1]

- Integrate information based on different metadata, e.g.: resources, user profile, bookmarks, and taxonomies.
- Provide interoperability with other systems (not only digital libraries) on either metadata or communication level or both.

- Delivering more robust, user friendly and adaptable search and browsing interfaces empowered by semantics

3.1 Components of Semantic Digital Library

- **Resource Management:** Each resource is described by the semantic descriptions according to the core ontology. Additionally a full text index of the resources content and MARC21, AND BibTEX bibliographic descriptions are provided. Each user is able to add resources via a web interface.
- **Retrieval features:** SDL provides searching and browsing features based on Semantic Web data.
- **User profile management:** In order to provide additional semantical description of resources, scalable user management based on FOAF is utilized.
- **Communication link:** Communication with an outside world is enabled by searching in a network of digital libraries. The content of the SDL database can be searched not only through the web pages of the digital library but also from the other digital libraries and other web applications. A special web services interface based on the Extensible Library Protocol (ELP) has been developed. [4]

4. COMPARATIVE ANALYSIS

It is widely accepted that there is increasing demand for more efficient Semantic Digital Library Software which will able to tackle a majority of different situations and problems which present Digital Library and Semantic Digital Library software are facing. At present only three fully developed and implemented Semantic Digital Software packages are available: JeromeDL, BRICKS, and Fedora. These three systems were assessed as having significant differences in their design, their underlying architecture, process and complexity for how they are implemented. These share common functions of knowledge organization and dissemination. There are, however, technical differences that impact on their ratings and ultimately on the selection of the recommended packages. It is also important to note that all systems are credible repository systems.

4.1 Comparisons of SDL

The main criteria that are applied for the comparison of the Semantic Digital Library Software are as follows:

1. General Properties
2. Architectural Aspects
3. Content & Metadata Aspects
4. Security & DRM Aspects
5. Semantic Aspects & Community features

In the following Tables a comparative overview of the three packages with reference to the above criteria is presented.

Table1: General Properties

Features	*JeromeDL*	*BRICKS*	*Fedora*
OS Support	Any	Any	Any
Hardware Requirements	500MB RAM, min 128 MB HD	500MB RAM, min 100MB HD	500MB RAM, min100MB HD
Software Requirements	Java1.5, Tomcat 5.5, Sesame	Java1.4/1.5, Jena	Java1.5, Tomcat, Kowari/ Mulgara or MPTStore
Current Stage	Research stable version 2.01/3.0	Second Prototype	Production Version2.2
No of Installations	12+	~8	~50monitored: large # of downloads unmonitored
Support Model	Open Source	Open Source	Open Source

Table 2: Architectural Aspects

Features	*JeromeDL*	*BRICKS*	*Fedora*
Distribution	Distribution searching (P2P), aggregated browsing	Fully decentralized (P2P)	Federation name resolver search services; Alvis P2P
Architecture Granularity	Low (main building blocks)	High (many Components)	High (core repository service with configurable modules; loosely coupled services)
DB – Support	Any Sesame- complaint backend	Any Jena Compliant backend	MySQL, Postgres, Oracle, McKoi; Kowari/Mulgara

Table 3: Content and Metadata Aspects

Features	*JeromeDL*	*BRICKS*	*Fedora*
Content Types	All	All	All
Content Models	JeromeDL Ontology	Any	Any
Metadata Schema	MarcOnt+ extensions	Any RDF/S & OWL schema	Any XML Schema, RDF/S & OWL schema
Query Types	Full- Text, Field- Search, Ontology- based, NL Query Templates	Full- Text, Field- Search, Ontology- based	Field Search, Ontology- based, Full-Text (Lucene or Zebra backed service)

Table 4: Security and DRM Aspects

Features	JeromeDL	BRICKS	Fedora
Security Model	FOAFRealm	RBAC	XACML Policy
Granularity	Resource	Component, Method, Object	Object, DataStream, Dissemination method
DRM Model	Fair use DRM Under development	MPEG-21 REL	DRM data streams
DRM Enabling Tool Support		Watermarking	

Table 5: Semantic Aspects and Community Features

Features	JeromeDL	BRICKS	Fedora
Reasoning	Recommendation engine based on Prolog	Configurable inference engine	Holding pattern
Tagging	Free tagging, Wordnet-based	Annotation middleware component	Middleware/apps
Taxonomies	Any	Any	Any
Knowledge sharing	SSCF Components	Via middleware upon BRICKS	Via middleware upon Fedora
Communities	SIOC and FOAF compliance		

Based on this comparison and additional features and the services offered it was felt that JeromeDL is a good option to try. The most attractive aspect of JeromeDL is its easiness in installation, platform independent and its portability features. [5]

5. CONCLUSION

Increasing investment in research and development as well as the trend produce more and more written information are challenges for Digital Libraries. High quality information is often stored in dedicated digital libraries, which are expanding islands of well organized information. However, managing this information still poses challenges. The Semantic Web effort has continued to explore the usage of metadata on the web, and has come up with additional ways how to meet these challenges, and future work should investigate augmenting library mechanisms with other technologies available. We envision future digital libraries will become multipurpose Knowledge Management systems based on technologies like Semantic web, Social network or Meshing up web services.

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Digital Libraries: A Case of Australia

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Abstract: This paper is the result of primitive study based on the visits made to university libraries in Canberra, Sydney and Melbourne. This paper presents an overview of digital libraries (DL) in Australian universities with a view to: (1) provide an understanding of the various DL and its services to their Clienteles; (2) identifying the various features including organisation of information, user interfaces, access and search and retrieval facilities and (3) understand of various DL projects by Australian government conjoint with other universities. This article showcases the latest trends in DL which has adopted technologies (i.e. open source or commercial or mixed) which gives insight to re-use of the knowledge. This enables to save the time of the users & library staff within the local infrastructure. The government plays a prominent role in development of DL and Universities themselves unite together to bring out the practical ways of handling resource sharing and cut down the budget constraint. This case study will provide hints for decision making to adopt some of these features in future planning of DL.

Keywords: Australia, Digital Libraries, Knowledge Organisation System, Search Interface

1. INTRODUCTION

This paper presents an overview of digital libraries (DL) in Australian universities with a view to: (1) provide an understanding of the various DL and its services to their Clienteles; (2) identifying the various features including organisation of information, user interfaces, access and search and retrieval facilities and (3) understand of various DL projects by Australian government conjoint with other universities.

The aim of this paper is to examine current trends in the development of digital libraries (DL), with particular reference to Australia (within the scope of libraries visited in person listed below) and to explain how digital library concepts are important for wider developments on the Internet. DL solutions are likely to be at the heart of the successful development of access and retrieval systems in the information ocean.

This article surveys progress with digitization in the libraries of Australia in planning and implementing major digitization projects (Warwick 2007). Australian digital libraries (at the Federal, State, and University levels) together join hands with commercial and research organisations to take part in various DL projects. In turn their focus is on development of digital library in aspects such as integrating the wider scope of all Australian digital collections, its integration and long term prevention of these digital documents, etc. This paper provides an overview of some of the current digital projects in Australia within the scope of visits made.

Currently the kinds of Knowledge Organisation System (KOS) being deployed varies in DLs. Hence there is a need to understand in depth about the knowledge organisation (KO) tools, such as library classifications, thesauri and subject heading systems and the Knowledge representation (Ontologies) that are being deployed in Digital Libraries (Bhojaraju.Gunjal and Shalini R Urs 2006).

2. SCOPE OF THE STUDY

The scope of this paper is limited to Canberra, Sydney and Melbourne libraries only. Universities are randomly selected, visited and analysed. These case studies do not depict the same aspects for

other parts of Australian libraries. List of libraries visited are mentioned at the acknowledgements section.

3. DIGITAL LIBRARY SERVICES

Other than normal library routines and services, some initiatives are observed in Australian libraries are listed below. Even though all libraries follow similar kind of services to their patrons, use similar kind of equipments, only few cases are shown at Appendix A.2.

Note: For the convenience sake, few examples have explained below just to show case the services and features of DL in Australia.

3.1 Resource Sharing

1 *BONUS+* - is a resource-sharing project that allows all staff and students of the member universities to request (hold) selected library materials from other institutions within Australia. The service is free-of-cost to the user. Current member institutions include: Deakin University, University of Ballarat, University of Melbourne, University of Newcastle, University of Technology Sydney and Victoria University. More details about this service, guidelines and steps to *How to Place a Request (Hold)* can be referred at http://w2.vu.edu.au/library/lending/bonus.htm (Bonus+ url).

2 *CAVAL Reciprocal Borrowing Scheme* - CAVAL is a reciprocal borrowing program that allows staff and students of participating libraries to borrow material from other participating libraries. More details are at http://w2.vu.edu.au/library/lending/caval.htm (CAVAL url).

3.2 Library Services

1 *Self Checkout/Borrowing* - To prevent waiting in the long queue libraries have provided Self Checkout/Borrowing facility to their users (Fig. A.2.1 – A.2.5).

2 *Book Returns* – Users can return their materials without going to the return counters by dropping in the respective sections of book return holes (Fig. A.2.6).

3 *After Hours Return* – Users can also return their materials even if the library is closed after hours/holidays (Fig. A.2.7 – A.2.8).

4 *Print/Photocopying* – Users can take print outs or photocopy of materials within the library through pay cards (Fig. A.2.9 – A.2.12).

5 *Microform Readers* – Equipments for Special collections such as microform readers/printers are provided for research users (Fig. A.2.13 – A.2.16).

6 *Moveable Book Racks* - Book racks can be moved as whole row along with the heaps of books through rotating the rod provided (Fig. A.2.17). This will save the space of the library.

7 *Internet Browsing Section* – Users can use the internet facility with limited download with in their account provided (Fig. A.2.18).

8 *Group Study Section* – Separate sections are provided with required infrastructure for group study and discussions within the library (Fig. A.2.19).

9 *International Cultural and news Center* – Most of the universities provide a separate section for the international culture and news for the users (Fig. A.2.20).

10 *Login Credentials* - All users are provided login credentials for accessing library and necessary portals.

11. *WebCT/Blackboard & Turnitin Anti-Plagiarism Support* - VU is committed to eliminating plagiarism and is encouraging students to take more responsibility while learning. The Turnitin website allows students to take help in this step. WebCT/Blackboard is a web-based application that allows user to access subject materials and communicate with other members of the class by using a web browser. When users log on to WebCT/Blackboard they will see a list of all WebCT/Blackboard courses to which users have been given access. Users can enter their course by clicking on its title. Depending on how their lecturer uses WebCT, user may also use it for submitting assignments and doing other types of assessment online.
12. *RefWorks* - is a web-based bibliography and database manager that allows users to create their own personal database by importing references from text files or online databases. Users can use these references in writing papers and automatically format the paper and the bibliography in seconds.
13. Library Services for Students with a Disability -

- Library works in close cooperate with Disability Services to support the library services and resources that need to be provided to students with a disability. More details are at http://w2.vu.edu.au/library/info/disabled.html (E.g. VU).
- Library services for those who need additional support to ensure equitable access. More details are at http://www.lib.uts.edu.au/services/specialneeds (e.g.: UTS). Few software and hardware available for Special Needs are:
  - Kurzweil 3000 - is an adaptive software solution designed for people with a print disability. It specifically targets the needs of low vision users as well as users with a learning disability such as dyslexia.
  - Voice recognition software - Some students may find it useful to input computer text or control applications by using voice commands instead of via the keyboard or mouse. Dragon Naturally Speaking Software is available

14 *Document Supply Service* - Search and Request facility is provided along with login credentials. This service is available to Staff, Masters, PhD and research students only. More details are at http://w2.vu.edu.au/library/lending/ill/

- Online Search & request System – is an online system which enables you to search, create and track your interlibrary loan requests. Search for Title of Journal/Book in OPAC @ CISTI, Libraries Australia, OPAC @ VU.
- CISTI Source – is a document delivery service from the Canada Institute for Scientific and Technical Information. 17,000+ journals are available and many subjects are covered. The majority of content is in Science, Technology and Medicine. This service is for postgraduates and staff only. More details are at http://dydo.infodiv.unimelb.edu.au/index.php?view=html;docid=2212 (e.g.: University of Melbourne) (CISTI url).

15 *Laptop Loans* - Laptop Loans for Student Use – Library laptops will be loaned out to VU Students for academic work. They will be available for use:

- within the library (to supplement in-library demand)
- for presentations (to accompany an LCD projector)
- loan period is 4 hours

16 *Home Library Service* - The Geelong Regional Library provide a home library service for people who are unable to access public libraries through any other means. The service is delivered free of charge by volunteers.

17 *Library Search Interface* – Libraries started integrating new technologies and web 2.0 features in their library tools to enable the users to provide new look and user friendly features.

- The new library Catalogue Search Interface is powered by commercial software i.e. Encore, Innovative Interfaces, Inc. – Its features can be referred at site http://www.encoreforlibraries.com/main.html (Encore url).
- Third party tools are used to integrate the book cover images, tags, etc in search results to give better User Interface (UI).
- In future, plan to implement advanced features such as information visualization (IV) aspects.

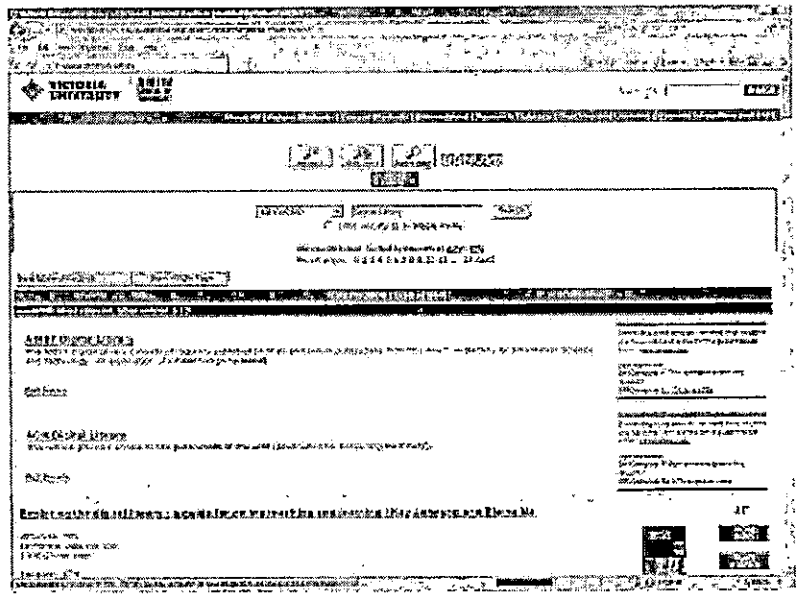


Fig. 1 Old Search Interface

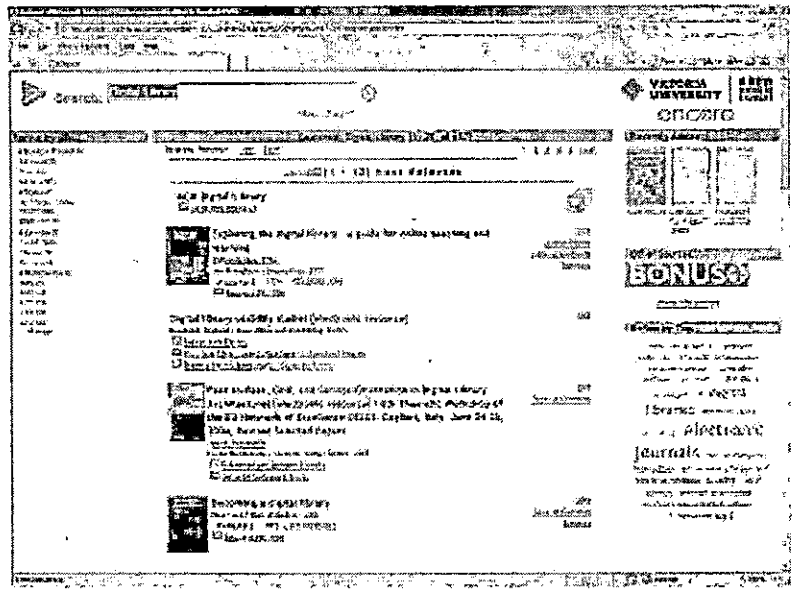


Fig. No.2 New Search Interface

3.3 Case Study: National Library of Australia (NLA), Canberra

The National Library of Australia (NLA) is the country's largest reference library. Its role is to ensure that documentary resources of national significance relating to Australia and the Australian people, as well as significant non-Australian library materials, are collected, preserved and made accessible either through the Library itself or through collaborative arrangements with other libraries and information providers (NLA url).

The NLA is managing a federated search project which aims to enable web users to search the collections of Australian archives, galleries, libraries and museums through a single search. Libraries Australia and Picture Australia is compliance with the OpenSearch search protocol and is registered as an OpenSearch source at A9.com. Users can use an OpenSearch compliant client to search Libraries Australia or even build their own service that includes Libraries Australia as an OpenSearch target. The NLA is encouraging Australian collecting institutions to support the OpenSearch protocol through its federated search project. Some of the digital projects from NLA are:

1 *Libraries Australia* - Libraries Australia is a resource sharing service coordinated by the NLA for Australian libraries and their users. It is used for reference, collection development, cataloguing and interlibrary lending. The heart of Libraries Australia is the Australian National Bibliographic Database (ANBD), which records the location details of over 42 million items held in most Australian academic, research, national, state, public and special libraries. The Libraries Australia service replaces earlier systems, Kinetica and the Australian Bibliographic Network (ABN) - which was created in 1981 to foster resource sharing by Australian libraries (Libraries Australia url).

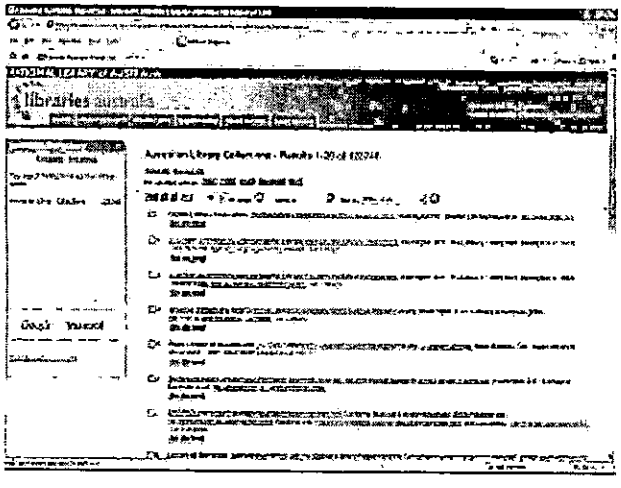


Fig. 3 Search Result Interface using OpenSearch

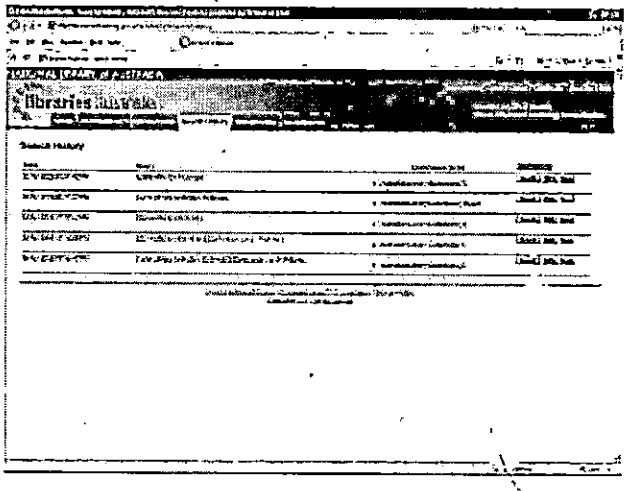


Fig. 4 Tracking Search History

2 Picture Australia - Picture Australia is an Internet based service that allows users to search many significant online pictorial collections at the same time. Picture Australia provides access to images that cover all aspects of Australian:

- Artworks include paintings, drawings, prints and posters of abstract art, fine art and portraits
- Photographs capture people, places and events
- Objects include sculpture, scrimshaw, bark, costume, weapons
- Images may be in black and white or full colour.

Picture Australia is an internet based discovery service that helps you find what digitised images cultural agencies hold in their collections. The diagram below outlines the request sequence. More details can be referred at http://www.pictureaustralia.org/about/index.html (Picture Australia url).

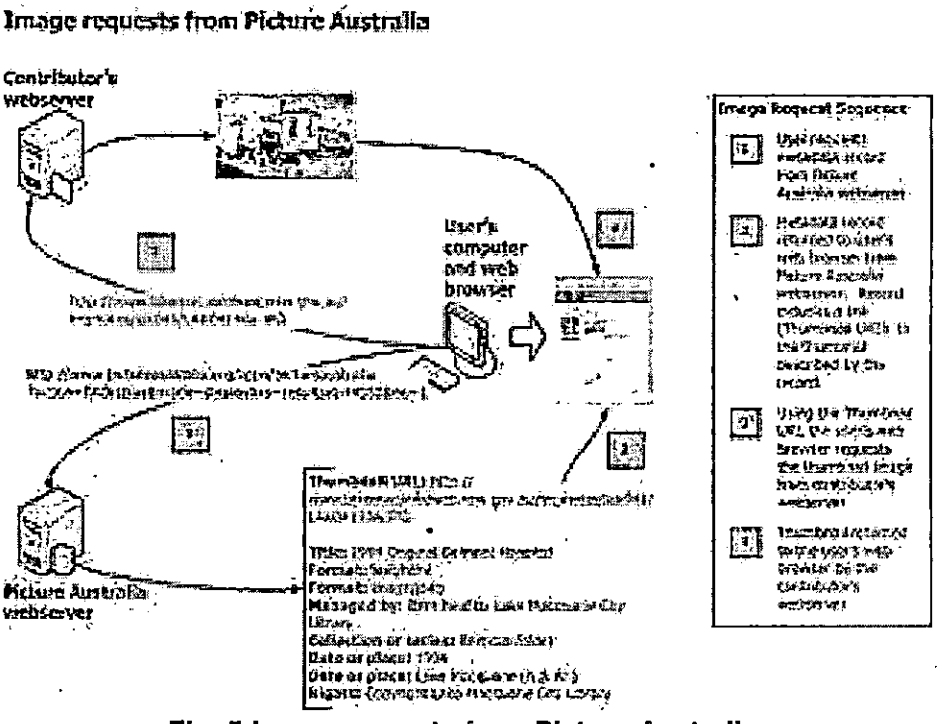


Fig. 5 Image requests from Picture Australia

Source: http://www.pictureaustralia.org/about/index.html

3 *Music Australia* - Music Australia is an online service developed by the NLA and the National Film and Sound Archive and other cultural institutions across the nation. Users can discover, access and navigate a rich store of information on Australian music, musicians, organisations and services, all from a single access point. Music Australia includes many different types of resources, such as music scores, sound recordings, websites and a range of other music-related material held by a large number of Australia's cultural institutions or described by specialist music services. Music Australia covers both, heritage and contemporary music, and includes all formats, styles and genres (Music Australia url).

4 *PANDORA, Australia's Web Archive* - PANDORA, Australia's Web Archive, is a growing collection of Australian online publications, established initially by the NLA in 1996, and now built in collaboration with nine other Australian libraries and cultural collecting organisations. The name, PANDORA, is an acronym - Preserving and Accessing Networked Documentary Resources of Australia (PANDORA url).

The purpose of the PANDORA Archive is to collect and provide long-term access to selected online publications and web sites that are about Australia, are by an Australian author on a subject of social, political, cultural, religious, scientific or economic significance and relevance to Australia, or are by an Australian author of recognised authority and make a contribution to international knowledge.

5 *Australia Dancing* - The Australia Dancing portal, hosted by the NLA, provides users with access to both current and historical information about dance in Australia. Australia Dancing is an initiative

of the NLA in partnership with key collecting institutions and the peak industry and advocacy body for dance in Australia – Ausdance (Australia Dancing url).

6 *RAAM* - The Register of Australian Archives and Manuscripts (RAAM) is a guide to collections of personal papers and non-governmental organisational records held by Australian libraries and archives (RAAM url).

3.4 Related Digital Library Projects

1 *ADT Program* - The aim of the Australasian Digital Theses (ADT) program is to establish a distributed database of digital versions of theses produced by the postgraduate research students at Australian universities. The theses will be available worldwide via the web. The ideal behind the program is to provide access to, and promote Australian research to the international community. The ADT concept was an initiative of 7 Australian universities (listed below) in association with the Council of Australian University Librarians (CAUL) (ADT url).

The original ADT membership group: University of New South Wales (lead institution), University of Melbourne, University of Queensland, University of Sydney, Australian National University, Curtin University of Technology and Griffith University.

2. *ARROW Project* - The Australian Research Repositories Online to the World (ARROW) project has been very successful in providing tools to enable accessibility and discoverability of research from institutional repositories. The NLA announced the new ARROW Discovery Service website and is operational at http://search.arrow.edu.au. Its new interface aggregates the institutional repositories of all Australian universities. Currently it contains more than 137,000 records harvested from 23 university repositories and 12 other research collections, including the Australasian Digital Theses program, and several e-journals (ARROW url).

The Service provides access to the research outputs of Australian universities: many are unpublished theses, preprints or postprints, as well as published journal articles, images, working papers and technical reports. The majority of items discoverable through the Service are available online. The Service is designed to provide instant access to scholarly resources to students, academics and members of the public. The NLA has introduced several improvements to the Service including a more intuitive search interface, including faceted browsing & tag clouds and more access to statistics, including tables of the most popular authors and institutions.

ARROW Community members are: Central Queensland University, La Trobe University, Macquarie University, Monash University, Murdoch University, National Library of Australia, Queensland University of Technology, Swinburne University of Technology, University of Ballarat, University of Newcastle, University of New England, University of New South Wales, University of South Australia, University of Southern Queensland, University of the Sunshine Coast, University of Western Sydney.

Metadata harvesting in ARROW will be taken care in below fashion. It uses transform MARCXML and ETD-MS metadata into Dublin Core for OAI-PMH and internal purposes (Bhojaraju Gunjal, Hao Shi and Shalini Urs 2008)

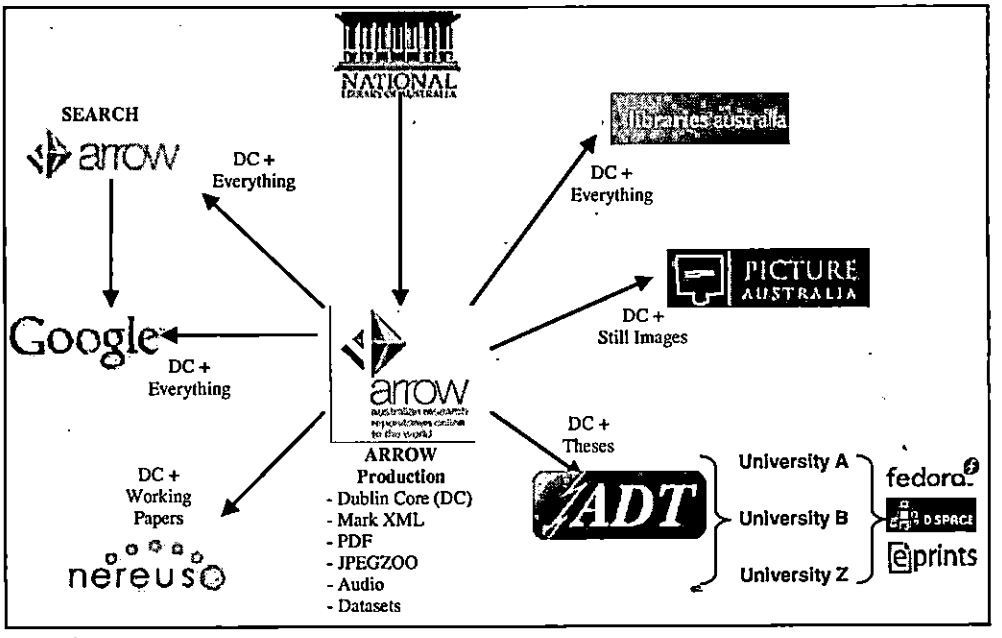


Fig. 6 Metadata Harvesting by ARROW

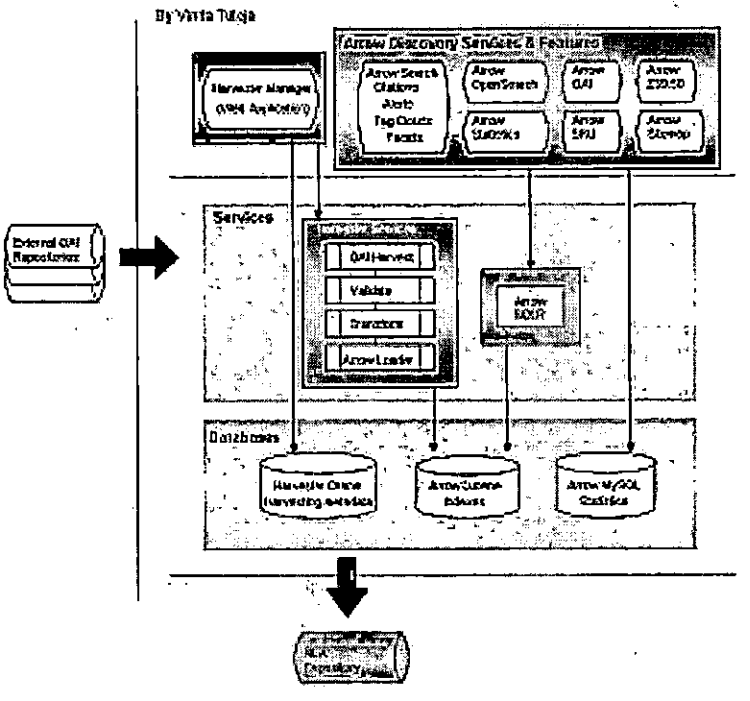


Fig. 7 ARROW System Architecture

Source: National Library of Australia

3 *DART Project*

The Dataset Acquisition Accessibility & Annotation e-Research Technologies (DART) project is an ambitious proof-of-concept project to develop tools to support the new collaborative research infrastructure of the future. The project aims to enable researchers and reviewers to access original

and analysed data, collaborate around the creation of research outputs, stored publications, plus add content, annotations and notes. It will also look at the collection of large datasets, including the remote control and automated data collection (DART url).

The DART project partners are Monash University (lead institution) in Melbourne, The University of Queensland in Brisbane and James Cook University in Townsville.

4 *ARCHER Project* - The Australian Research Enabling Environment (ARCHER) project has setup dedicated development teams within each partner University to: analyse eResearch data collection; analyse information management needs and requirements, and take special note of existing IT applications and services in each research area. The ARCHER development teams have built upon the prototype software developed by the DART and ARROW projects to produce a robust set of software tools (ARCHER url).

The ARCHER project partners are Monash University (lead institution) in Melbourne, The University of Queensland in Brisbane and James Cook University in Townsville.

5 *APSR Project* - The APSR Project aims to establish a centre of excellence for the management of scholarly assets in digital format. APSR is a partnership that aims to promote excellence in building & managing these collections of digital research objects. The Partnership receives Federal Government funding to assist Australian researchers with research information management. To this end, APSR conducts outreach and educational programs and undertakes collaborative development of systems and tools. APSR works closely with research communities, information professionals, technical staff, and higher education policy makers on a series of development projects, surveys, publications, seminars, and training workshops (APSR url).

Current partners in this project are: The Australian National University, National Library of Australia, The University of Queensland, The University of Sydney, The Australian Partnership for Advanced Computing, The University of Melbourne and University of Technology Sydney.

4. CONCLUSION

The government plays a prominent role in development of DL and Universities themselves unite together and brings out the practical ways of handling resource sharing and cut down the budget constraint.

Initial observations made from the study are:

- UI is improved by commercial software in some libraries. Third party tools are used to give better UI to the users in the search results. (e.g.: integrating the book cover images, tags, etc in search results).
- Usability of information visualization (IV) aspects in DL is in progress and yet to implement.
- Mandatory submission of theses has yet to implement in all universities. Few universities (e.g.: UNSW) has mandated students to submit their work in digital copies along with hardcopy.
- All universities are not mandated to collect theses in digital format from their students/staff due to copyright issue. This may be one of the hurdles in developing digital libraries in e-scholarly publishing area. This may be due to various reasons viz.
  - not to make work public (students' perspective)
  - information may contain Cultural sensitiveness
  - may be funded by company (due to commercial use/intellectual property reasons)

The libraries of Australia have been active in recent years in planning and implementing major digitization projects. Digitization projects are commonly scoped with a view to avoiding potential infringement of copyright, or avoiding the complexities that arise from uncertainties in this area. For example, libraries may seek to avoid copyright issues with future digitization projects by negotiating permissions at the time of acquisition (Warwick 2007).

To sum up, development of DL is rapid and lot of tools i.e. both commercial and open source are available now-a-days can integrate to enhance the search strategy and Information Retrieval (IR) process to give better UI. Hence the hybrid model with different aspects of KOS deployed in DL will enhance the IRS process and may be a suitable solution (Bhojaraju Gunjal and Hao Shi 2008).

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• Fides Datu Lawton, Director (Library Resources Unit) • Gabrielle Gardiner, Library IT Manager • Beth Marnane (BONUS+) • Alex Byrne, University Librarian	University of Technology, Sydney	Sydney
• John Shipp • Sten Christensen	University of Sydney	
• Tom Ruthven, ARROW Project Manager • Maude Frances, ARROW Project Manager • Andrew Wells, University Librarian	University of New South Wales	
• Alison Dellit • Debbie Campbell • Warwick Cathro	National Library of Australia	Canberra
• Sue Kosse • Vic Elliott, Director, University Librarian	Australian National University	
• Philip G Kent, University Librarian • Laura Maquignaz, Manager, Inform Resources • Jane Miller, Electronic Information Systems & Services Librarian	Victoria University of Technology	Melbourne
• Eve Young, Coordinator, Digital Repositories, Information Services	University of Melbourne	
• Michael Wood, Repository Manager • Ian Smith, Manager – Library Human Resources	LaTrobe University	
• Craig Anderson, Director	RMIT University	
• Andrew Harrison, Arrow Librarian	Monash University	
• Joan Moncrieff • Craige Hicks • Pat Scott • Anne Horn, University Librarian	Deakin University	

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Digital Libraries: Some Futuristic Interpretations and Issues

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Abstract: Digital libraries are gaining importance in the environment of computer and communication technologies. This is general truth that they are providing us the desired information in very shortest time, but on the other hand they are posing serious problems to us. This paper presents a general view about digital libraries and their future prospects with some remedies to overcome the arising problems.

1. INTRODUCTION

Digital libraries are the complex and advanced forms of information systems that can be endowed with a multiplicity of functions and features. Sometimes, these are called as electronic infrastructures and information highways. etc., but a library is not the same thing as one called it an infrastructure (Nunberg, 1993). A library adds value to information resources by organizing them and making them available. Additionally, a library serves distinct sets of stakeholders: communities of frequent, casual, and potential users. Unlike museums, it is seldom the materials in libraries that attract people but rather the ideas carried by the materials, the conceptual structures that support access, and the community of stakeholders who use the library. Because books and other physical information resources and people occupy physical space, libraries have evolved complexes of buildings, rooms, and mobile spaces in which books and other materials and people come together. These places, however, are more than physical space – just as a home is more than a house. They are defined by functions and communities, just as are libraries; they can also stimulate and can represent states of mind. Thus, places are as much about ideas and states of being as they are about physical space. This physical-conceptual continuum parallels what we mean by libraries: places that marry physical space with intellectual space, to link people to ideas and to each other (Dhiman, 2003b). These fundamental characteristics of libraries – systematic access to information resources, the ideas represented by those resources and sets of human stakeholders – also extend to digital libraries.

Bush (1945) was the first man who wrote about the "memex," which is often cited as stimulating much of the early application of computers to information retrieval. Although the memex was a mechanical device based on microfilm technology, it anticipated the idea of hypertext. Licklider (1965) coined the phrase "library of the future" to refer to his vision of a fully computer-based library, and about one decade later, Lancaster (1978) wrote of the soon-to-come "paperless library." Meanwhile, Nelson (1974) invented and named hypertext and hyperspace. Closer to the present, other terms such as "electronic library," "virtual library," "library without walls," "bionic library," and others have been used.

Though, the words electronic library, virtual library and digital library are taken as synonymous to each other but according to (Richvalsky and Watkins, 2008) an electronic library is the same thing - but the term should be deprecated, because the term "electronic" is less precise: it might include analogue data formats, or it might refer to the subject of "electronics". A virtual library is a collection of resources available on one or more computer systems, where a single interface or entry point to the collections is provided. The key point being that the user need not know where particular resources are located - the location is "virtual". The term "digital library" is the most recent in a long series of

names for a concept that has been written about nearly as long as the development of the first computer: a computerized "library" that would supplement, add functionality, and even replace traditional libraries. It is noteworthy that both digital and electronic libraries can be virtual libraries if they exist only virtually - that is, the library does not exist "in real life." For example, a virtual library can consist of material from a variety of separate libraries that are organized in a virtual space using computers and computer networks.

2. SOME DEFINITIONS

The term "digital library" is variously defined by different scientists in their own ways. Some of the important definitions are briefly explained as under.

Miksa and Doty (1994) take a traditional perspective in defining a digital library, *'as a collection of information sources in a place (if not a physical place, then at least a logical one).'* They argue that a broader definition would lead to something different than what is normally understood to be a library.

Wellman, et al (1996) see a *digital library of the future in which software agents use principles of artificial intelligence (AI) to perform "monitoring, management, and allocation of services and resources."* Indeed, they define a digital library as a "*community of information agents*" that would retain most of the properties of the traditional library.

But the definition given by Association of Research Libraries in 1995 seems to be representing all facets of digital library. It reads as : A digital library is identified with following five elements.

i) The digital library is not a single entity.

ii) The digital library requires technology to link resource of many libraries

iii) The linkage between the many libraries and information services are transparent to each other.

iv) Universal access to digital libraries and information services is a goal.

v) Digital library collections are not limited to document surrogates: they extend to digital artifacts that cannot be represented or distributed in printed format.

This definition introduces the concept of distributed and linked resources. The resources are collections and information services. The digital collections are digital surrogates, non-printable objects and digital artifacts that cannot be distributed in print form. More comprehensively, a digital library can be defined as:

"A digital library system portal that comprises of components of electronic resources, bibliographic databases of full-text journal and other knowledge-based information sources made available through the Internet and required by various sectors teaching and learning communities. It provides access to specialized information services including electronic databases, online reference enquiries, interlibrary loan, digitization, and electronic publishing. One of the vital components is the capability to create, search, use, store, and preserve local publications and information of national and international interests accessible on a subscription or pay per view basis. In this sense, they are an extension and enhancement of information storage and retrieval that manipulate digital information in any medium (text, image, sound, static or dynamic images) and exists in digital networks."

3. PROPERTIES OF A DIGITAL LIBRARY

A digital library contains digital representations of the objects found in it. A quite recent understanding of "digital library" probably also assumes that it will be accessible via the Internet, though not necessarily to everyone. But the idea of digitization is perhaps the only characteristic of a digital library on which there is universal agreement. Some of the important properties of digital library as given by Harter (2008), ranging from traditional to broader view, are presented in the following table.

Table 1: Important Properties of Digital Library

NARROW VIEW (based on traditional library)	BROADER VIEW (a middle position between the extremes)	BROADEST VIEW (loosely based on current Internet)
objects are information resources	most of the objects are information resources	objects can be anything at all
objects are selected on the basis of quality	some of the objects are selected on the basis of quality	no quality control; no entry barriers
objects are located in a physical place	objects are located in a logical place (may be distributed)	objects are not located in a physical or logical place
objects are organized	–	no organization of the objects
objects are subjected to authority control	some aspects of authority control are present	no authority control
objects are fixed and they do not change	objects change in a standardized way	objects can be changed and mutate at any time
objects are permanent and they do not disappear	disappearance of objects is controlled	objects are transient and they can disappear at any time
authorship is an important concept	concept of author is weakened	no concept of author
access to objects is limited everyone	access to some objects is to specific classes of users of users	access to everything by limited to specific classes
services such as reference assistance are offered	–	the only services are those performed by computer software (AI)
human specialists (called librarians, etc.) can be found	–	there are no librarians
there exist well-defined user groups them	some classes of objects have associated user groups	there are no defined user groups or, alternatively, infinitely many of

Above table summarizes essential characteristics of a traditional library along with corresponding properties from the point of view of a digital library. The extent to which each property is incorporated defines that digital library. For example, a digital library may be organized by human specialists (indexed, classified, catalogued) or it may be entirely unorganized, using free text searching for providing some or all access to the objects in the library.

The traditional library has a physical location, embodied in its physical building. Most of the objects in a traditional library are information resources of some kind, depending on the type of library. In some traditional libraries, recreational materials are also included. The works in the traditional library are also selected. Criteria for the selection process are defined, and these criteria typically include measures of quality. The objects (information sources) in it are organized - classified, catalogued,

and indexed by human beings, in what are called value-added processes (Taylor, 1986). Authority control is a key feature, in which names of authors, variants of works or the editions, and subject headings or descriptors are all controlled. The concept of authorship and ownership are extremely important in a traditional library, in which various forms of an author's name are brought together in a name authority file. But in case of digital libraries, sometimes authorships are unknown and there is no control over them.

The objects in a traditional library have certain properties as well. First, they are fixed - they do not normally change, or if they do, various editions are identified and considered to be different from one another. Objects are also permanent - they do not normally disappear from a collection. In case of digital libraries, objects change as and when new information is uploaded; earlier one is replaced. That is why the information in digital environment keeps changing all the times.

4. INFORMATION RESOURCES IN DIGITAL LIBRARIES

The information resources to be found in a digital library depend on the library's collection development policy, on what the users of the library want to be included, as well as on what is technically and economically feasible (Dhiman, 2008a). But the important issues are not so much what kinds of resources are possible as what can be afforded and more important, what is needed. These decisions can be made only by the librarians and the user groups that are involved.

Harter (2008) has illustrated the kinds of resources that are implied by one's view of a digital library. A narrow view would reproduce the information resources found in traditional libraries that support teaching and research functions. First are the kinds of metadata that libraries have been producing for centuries: indexes, catalogues, and the like. Also included here would be meta-metadata, including catalogues of catalogues and libraries of libraries. In addition, more and more full texts are available in digital form, as well as multimedia collections of all kinds. Finally, various sets of numerical data are the sources for inclusion.

If supporting scholarly communication and research is a goal and a broader view of the digital library is taken, then there are several kinds of information resources not collected by the traditional library that might be considered. These artifacts of the Internet are products of informal communication among scientists and scholars that are produced in digital form and are easily captured and saved. Such resources as preprint archives, listserv and newsgroup postings, transcripts of scholarly MUDs, etc., and even collections of email fall in this category.

An even broader view considers resources that are not normally considered to support scholarly communication or research but which are found in many libraries, especially public libraries. These include games and other recreational materials, commercial information, and materials produced by special interest groups (for example, different or radical political movements, environmental groups, and other "anti-establishment" organizations). Also included might be materials of all kinds produced by individuals; almost anything found on the Internet can be considered for inclusion.

Finally, the notion of traditional library services should be considered. If a digital library is a library, then perhaps it ought to include services such as ready reference, help with search tools, access to and assistance with commercial search services, etc. Such services are already being provided by some digital libraries.

5. CHALLENGES OF DIGITAL LIBRARIES

It is seen that with the advancement in the ICT, the digital libraries are growing up. At one hand, they are providing us information just in a fraction of minutes; on the other hand, they are posing many problems in front of us. The following are some of the major problems which have to be sorted out for further strengthening of the digital libraries.

5.1. Quality Problem

How can we establish and control the currency, accuracy, and integrity of information sources? This is a serious question in front of libraries and the librarians. A digital library is not only known to the extend and nature of collections its own but also to establish a defined set of information to be made available including value added services that they layer on top of overlapping electronic collections. Aspects of their distinctive identities, services to user communities, emphasize their owned collections and promote institutional objectives, provide access to and kind of support or online help the virtual collections.

5.2. Interoperability

Interoperability is the ability to store and retrieve material across diverse content collections administered independently. It brings an inter-relationship between information service related disciplines like – library management, archives management, museum management, document management, knowledge management, and e-commerce management.

Interoperability allows organizations and communities to retail their specialist practices, while putting high-level standards and protocols in place for sharing the information. It is difficult to achieve as it requires resources' creators, users, funding agencies, systems and resource managers to agree on the development of standards and formats for information interchange that may not map exactly onto their established practices. The interoperability problems that librarians solve routinely for conventional collections are more difficult in the world of software-enabled digital libraries.

5.3. Intellectual Property Rights

Managing intellectual property rights is another challenging problem that the digital libraries have to face. Libraries need flexible licenses that enable them to legally create archival collections and to transfer content to newer storage technologies for preservation. Licensing arrangements become complex as libraries purchase and share access to both print and electronic versions of materials. The legal liability of providing access to licensed materials can be far greater with digital information products than with their print counterparts, given the ease with which unscrupulous users can gain unauthorized access. In addition, libraries may need to charge users for access to materials. For all these functions, libraries need cost-effective, flexible, and easy-to-use software to manage access rights and copyright expenses, as well as to handle billing and payment.

We recognize that technical solutions may be inadequate to address all of the intellectual property issues that exist in the context of digital libraries. Other solutions, even including Congressional legislation, may ultimately be needed to balance the interests in individuals, institutions, and copyright holders. Continued research is required to give digital libraries the ability to manage intellectual property rights and to protect those rights while not inhibiting users' legitimate access to materials consistent with those rights. Dhiman (2003b) has also discussed various issues pertaining to intellectual property rights in digital environment.

5.4. Privacy and Security

A related set of challenges for digital libraries is the ability, or in some cases, the requirement to protect digital contents from unauthorized access or from unauthorized or uncontrolled use of that content such as replicating and transmitting it to others. In some cases (for example, digital music) privacy and security technologies are required to protect the rights both of the content owner and the consumer and to enable vibrant electronic commerce. In other cases (for example, health care), privacy and security are even more critical. These challenges, which are at the core of many of today's digital intellectual property issues, have yet to be solved in broadly applicable ways.

5.5. Human Use

Usability has always been a difficult problem in networked software systems. It is a key issue in the design and operations of global-scale networked digital libraries. A number of difficult problems are yet to be solved. How can content, both spoken and written, be made accessible to speakers of diverse languages? How do we make digital libraries equally usable to persons of diverse skill levels (for example, teachers and students)? How do we make our input and output devices (for example, keyboard, mouse, monitor, and spoken word) more flexible? How can we facilitate efficient searching for images, for example, in collections of millions or even billions of such digital objects? How do we mitigate the problems, which occur especially with large multimedia files, associated with varying access bandwidths?

These issues are also related to human use or the personal information management. We must also consider evolutionary characteristics of behaviour, systems that learn, personalization, system to system migration across generations of technologies, and similar questions. This is connected to human-computer interface studies and also to studies of how individuals and groups seek, discovers, use and share information, but goes beyond the typical concerns of both to take a very long time horizon perspective.

5.6. Preservation Problem

As more and more of the activities in our lives are captured, represented and stored in digital form, the questions of how we organize, manage, share, and preserve these digital representations will become increasingly crucial (Lynch, 2005). Long-term storage technologies and efficient procedures for transferring ephemeral content into long-lived storage have not yet been developed. In addition, cost and space constraints are driving librarians to share collections and services. It is seen that the cost of maintaining a research collection continues to grow as much as 15 percent a year. The Internet has facilitated this practice since networked collections can be made available instantly to anyone anywhere. Research on cost-effective long-term digital storage technologies and efficient archiving and preservation processes are pressing needs. We have to adopt some kind of digital information policy for digital preservation to overcome the problem (Dhiman and Gupta, 2007).

5.7. Institutional Repositories

Most of the digital libraries attached to leading institutions have started to develop institutional repositories. Institutional repositories are simply the posting of an institutional work or output on the net for further use by the scholars. These are one of the best way to access information of an institution but we have to decide, will the access to some institutional repositories be limited to some classes of users? In additions, the legality is also associated with the institutional repositories and how can copyright laws for IRs be observed?

5.8. Services

What services, if any, should be offered by the digital library? It offers information service that is a networked online information space in which users can discover, locate, acquire access to and, increasingly, use information. Today's digital library systems are capable of making available information or knowledge through various means and format. Books journals, paper-based archives, video, film, and sound recordings are as visible in the digital library service environment as are online catalogue, findings aids, abstracting and indexing of documents, e-journal, e-books, digitized collection, geographical information systems, Internet sources and other electronic holdings. Opportunities of access are now beyond the boundary of desktop and laptop PCs. Digital Libraries can now be accessed through mobile phones and PDAs, and libraries can integrate services to include providing information services via Mobile SMS and MMS services. What services can be provided by a digital library have also been discussed in detail by (Greenstein, 2000), we have to emphasize over them.

5.9. Integration

We are running parallel with many traditional libraries. In next coming 50 to 60 years, traditional libraries are not going to be abolished, they will survive. More discussion in this regard has been made by Dhiman and Gowami (2008). But the important question arises, should digital libraries be integrated into traditional libraries? If so, how can this be accomplished? We have to solve out this problem also.

5.10. Librarianship

Does a digital library have librarians? If so, what do they do? This is the most burning question. Most of the digital libraries, particularly those are residing over Internet only have this type of problems. This is more serious problem and no professional is looking the control of so called 'virtual libraries' over net. Besides, the ways of management are also changing in digital environment (Dhiman and Rani, 2004 and 2005), so we need to adjust accordingly.

Lastly the question is 'well defined users'. Does a digital library have well-defined classes of users? If do not have, we should have them. If well defined users are not available what is the use of digital libraries? Well defined users, mean the users with at least accessing abilities for the information from the Internet.

6. SOME INITIATIVES IN INDIA

Some initiatives already began to work in India, the Traditional Knowledge Digital Library (TKDL) is a knowledge repository of the traditional knowledge setup by the NISCAIR (National Institute of Science Communication and Information Resources), CSIR, Government of India, New Delhi. The objective of this library is to protect the ancient and traditional knowledge of the country from exploitation such as bio-piracy and unethical patents (http://www.niscair.res.in/). Muktabodha, Digital Library and Archiving Project was begun in 1995 as a manuscript microfilming project focusing mainly on photographing at-risk and rare palm-leaf Vedic Shrauta Ritual manuscripts from both private collections and from libraries (http://www.muktabodha.org/). Kalasampada, a Digital Library- Resource for Indian Cultural Heritage (DL-RICH) project sponsored by Ministry of Communication and Information Technology (MCIT) (http://www.ignca.gov.in/dlrich/) aims to use multimedia computer technology to develop a software package that integrates variety of cultural information and helps the

users to interact and explore the subject available in image, audio, text, graphics, animation and video on a computer in a non-linear mode.

One of the enduring digital library projects is the Vidyanidhi digital library and e-Scholarship portal project at the University of Mysore (www.vidyanidhi.org.in), which began as a pilot project in 2000 to demonstrate the feasibility of Electronic Theses and Dissertations (ETD) in India with funding from NISSAT (National Information System for Science and Technology), DSIR, Government of India. Vidyanidhi funded by the Ford Foundation, today is one of the largest repositories of Indian theses. It accepts any thesis or dissertation from any researcher or the student, accepted by Indian Universities or the institutions.

Institutions like IISc; IIT (Delhi & Kharagpur); National Institute of Technology (NIT), Rourkela; National Aerospace Laboratories, Bangalore; National Chemical Laboratory, Pune; INFLIBNET, Ahemdabad; National Institute of Oceanography, Goa; Raman Research Institute, Bangalore etc. have established *Open Access Institutional Repositories* (Singh et al., 2006), which are disseminating research outputs of their respective institutions. There are also the repositories, which accept scholarly publications from any professional or the researcher who is working in the respective field or subject area. *Librarian's Digital Library* (LDL) of DRTC, Bangalore is such a subject–specific repository for the library and information professionals. *OpenMEd@NIC* is maintained by National Informatics Centre, New Delhi. It provides access to biomedical literature (Dhiman and Sharma, 2008 a & b). Academies of Science in India are also supporting the Open Access movement by making journals available online free. Indian Academy of Sciences and its journals are available open access and are available free in full text as PDF files on each journal's website. Indian National Science Academy has also made its journals available online and their access is free.

The efforts and initiatives to enhance access to electronic journals and digital resources to the academic community in India have resulted in two major consortia based programmes – INDESET and UGC-INFONET. INDEST or the Indian National Library in Engineering Science and Technology Consortium (http://www.indest.iitd.ac.in), is a funded project of Ministry of Human Resource Development (MHRD), which provides funds for subscription to electronic resources for participating institutions including IISc, IITs, NITs, IIMs and a few other centrally-funded Government institutions through the consortium headquarters set-up at the IIT, Delhi. Another consortium UGC – INFONET Programme is a joint venture of ERNET India and University Grants Commission, New Delhi, which is spearheaded by the INFLIBNET, Ahemdabad. Under this programme, about 149 universities across the country are getting access of electronic resources subscribed by the consortia (http://www.inflibnet.ac.in/).

There are also significant contributions from private sector. One such significant contribution from the private sector to the Open access movement in India is the Open J-Gate from Informatics India Limited, Bangalore (www.openjgate.org). Open J-Gate is an electronic gateway to global open access journal literature which was launched in 2006. It provides seamless access to millions of journal articles available online. Open J-Gate is also a database of journal literature, indexed from 3000+ open access journals, with links to full text at Publisher sites.

7. CONCLUSION

Concluding we can say : "as Internet continues to grow and become a major publishing medium, learning will emphasize more on Internet based library, and physical presence will be a thing of the

past". We have seen though there are some of the problems to which we have to overcome but the future of digital libraries promises a world in which vast amounts of information of all types - text, images, photos, sound, video, animation - will be available to people wherever they are. The vision of being able to access news, magazines, professional articles, bulletin boards, catalogues, personal mail and the like from a personal computer at home, in the office, or even on the beach is compelling. In this way, the digital libraries have been evolving a best way of resource sharing.

Libraries and librarians will be more relevant and information literacy will be the core competency requirements for the survival in floods of information. It can be speculated digital libraries will be more like interactive communication tools that allow users to interact with each other through document in the future. The librarians need to adopt "future pull" thinking in order to forecast the future in a realistic way, and prepare ourselves and our libraries for it. We need to adopt some of the techniques used by futurists to identify problems, focus thinking, and plan future directions. Chowdhury and Chowdhury (2003) rightly state that – while computers and the Internet are primary tools on which digital libraries are build, a variety of technological, computer and communication skills and information organization and retrieval skills are required of the people who manage them. So we need to train the library professionals. According to the changing environment to avail the maximum benefits of the technology. But it took many years to reach at the present state of digital libraries and the goal of fully digital gateways just like *Google scholar* to access simultaneously the existing library database and e-resources of different publishers and scholarly resources of the Internet will take a long time.

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Digital Library Open Source Software: A Comparative Study

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Abstract: Open source digital library software is gaining popularity nowadays. To build a digital library economically, s open source software is preferable. Many open source software packages are available for organizations and individuals to create digital libraries (DLs). However, a simple to use method to evaluate these DL software packages does not exist. This paper attempts to prepare a comparison chart based on features, function and usability of open source software for Digital library like DSpace, Greenstone Digital Library and EPrints.

Keywords: Open Source Software; Digital Library; DSpace; Greenstone (GSDL); EPrints; Digital libraries

1. INTRODUCTION

Digital libraries (DLs) facilitate creation, organization and management of multimedia digital content and provide search, retrieval and other information services over computer networks and other electronic media. Developments in DL technologies have changed the way people access and interact with information, and have also extended the concept of libraries far beyond physical boundaries.

Digital library systems have the potential to empower users, not just librarians, to conceive, assemble, build and disseminate new information collections (*Bainbridge et al., 2003*). Therefore, one of the key functionalities of a digital library should be the matching of user work patterns. To achieve this, a thorough understanding of the users of libraries and the system itself should be obtained. Apart from the need for deeper understanding of users, the relation between the tools used to establish the DL and the necessary requirements has to be ascertained.

2. METHODOLOGY

After it was decided to prepare a chart for the evaluation of three major open source software for digital library, an exhaustive search was conducted on internet, journal articles and conference proceedings to identify the parameters needed for evaluation. This review of literature related to digital libraries helped authors in identifying the key parameters needed for evaluation. The three softwares namely, DSpace, EPrints and GSDL were compared according to the chart. The observations helped authors to formulate findings and recommendations.

3. DIGITAL LIBRARY

Digital libraries enable the creation, organization, maintenance, management, access, sharing and preservation of digital document collections. Digital libraries are being created today for diverse communities and in different fields: such as education, science, culture, development, health, governance and so on. It may be also to accumulate locally produced collections of information or to build a repository of the scholarship of an organization. Digital libraries may differ from organization to

organization that implements them. It may be dissemination of information, preservation and propagation of indigenous culture like virtual museums.

4. OPEN SOURCE SOFTWARE

Although Open Source software has existed since the 1960's *(Weber, 2004)*, only in the last few years it has got much attention. In 1983 the Free Software Foundation was founded by Richard Stallman *(Hars and Ou, 2002)* and the term 'Open Source' was introduced in 1998 *(Raymond, 1998)*. Since then more and more companies have taken huge interest in Open Source software. Recently Novell acquired Suse Linux, one of the distributions of the Linux operating systems, taking their embrace of Open Source a step further *(Novell, 2003)*, and with this it also expanded the enterprise market for Linux.

Linux and Open Source are often linked in Open Source literature, and it may seem that Linux and its added software is all there in the Open Source market. However, Open Source software is much more than Linux and Linux-compatible software *(O'Reilly, 1999)*. Many more examples of Open Source software exist, such as the Apache web server, with a market share of almost 70% *(Netcraft, 2005)*, the web language PHP, the database server MySQL, the office suite OpenOffice.org and a very large number of web applications *(Wheeler, 2004)*.

The instructions that make up the 'recipe' for a software package are called as "source code" in the case of Open Source software, this source code is freely available *(Weber, 2004)*. The term Open Source is defined by the Open Source Initiative (OSI) in the Open Source Definition *(OSI, 2002)* It can be summarized as:

- The software must be freely distributable
- The source code must be included in the distribution or there is a well- publicized method of obtaining the source code
- Derived works and modifications are allowed
- The license must not be specific to a product, not restrict other software and be technology-neutral

Open Source software development

Open Source software offers the source code along with the software, at no charge. This enables the user to change the instructions of the software, changing its behaviour, adding functionality, and so on. It gives anyone the opportunity to participate in the development of the software project *(Wheeler, 2005)*. Open Source projects are, in most cases, run on the Internet. *(Weber, 2004)*. Open Source projects' websites carry much information: discussions, documentation, bug databases, and so on. This information is very valuable for the evaluation of Open Source software.

Most Open Source projects encourage users to participate in the project in any way they can, from filing bug reports to the development of the source code. When the user wants something changed or added to the software, he is at liberty to do it himself, but by working together with the project community and contribute the changes in source code back to the project, the code will be a part of the software for everyone, which will keep it maintained and avoid problems when upgrading the software. If the user keeps the code to him, he will have to find a way to integrate any updates to the software in with his changes *(Glass, 2003)*. Open Source software developers work together

voluntarily to create and improve a product they want to use. They also get a certain satisfaction from being part of the project.

5. DIGITAL LIBRARY SOFTWARE PACKAGES

For the construction and administration of a digital library one needs digital library software. Many commercial digital library software packages are available today. But they are too costly to be afforded by average libraries. These proprietary software packages also require high installation costs followed by recurring annual maintenance costs (AMC) and/or updating costs. A remedy for this situation is the adoption of open source software for digital library purposes. With the recent availability of several open source digital library software packages, the creation and sharing of information through digital library collections has now become an attractive and feasible proposition for library and information professionals around the world. To build a digital library under economical conditions open source software is preferable. An attempt has been made here to discuss and compare three major open source digital library software, namely, DSpace, Greenstone and EPrints.

5.1 DSpace

MIT (Massachusetts Institute of Technology) and HP (Hewlett-Packard) have created DSpace software as digital repository to manage intellectual output of multidisciplinary Research and Development organizations. DSpace supports digital preservations, planning and managing institutional repository in a large institution. DSpace allows workflow and customization. It supports community/ collection based content and submission by different user community *(http://www.dspace.org).*

5.2 GreenStone

This software is for building and distributing digital library collection. New Zealand Digital Library Project at the University of Waikato has developed and distributed this in cooperation with UNESCO and the Human Info NGO. This open source software can handle multilingual documents, with search and browse facility under GNU General Public License *(http://www.greenstone.org).*

5.3 EPrints

Is the largest and widely distributed and installed digital library software developed by University of Southampton, with minimum technical expertise. The software can be installed by any institution world over. By its integrated advanced search, extended metadata and other features, the software can be customized to local requirements *(http://www.eprints.org).*

6. Parameters for Comparison

The criteria for the Open Source software evaluation model were established using Open Source literature on the subject of evaluation of software. Because scientific literature is still somewhat scarce on the subject, authors had to make intensive web searches to find the required resources helpful for making a meaningful comparison. The web searches were done to find the most prominent articles on Open Source maturity models, Open Source success factors and Open Source software evaluation. Two Open Source maturity models were found, as well as three articles giving advice on selecting Open Source software and one research article that investigated Open Source success factors.

In order to identify the criterion that gives a good general idea of the Open Source software that needs to be evaluated, all criteria were listed and the terms covering the same areas were grouped together.

These nine criteria are applicable to almost any type of Open Source software and give a good general indication of the software.

6.1 Digital Library Software and their comparative study

Table-1 Comparison of DSpace, GSDL and EPrints Software.

	DSpace	*GSDL*	*EPrints*
Creator	MIT libraries & Hewlett Packard	University of Waikato	University of Southampton
Open Source and Free	Yes	Yes	Yes
Operating System	UNIX or LINUX, Windows	UNIX, Windows	UNIX
Web-Server	Apache and Tomcat	Apache/IIS	Apache
Language	Java and JSP	C++, Java and Perl	Perl
Database	PostgreSQL	Its own	MySQL
Resource Identifier	CNRI Handles	No	OAI identifiers
Dublin Core	Qualified Dublin Core	Dublin Core	Dublin Core
METS	Yes	No	No
OAI-PMH	Yes	No	Yes
Subscription	Yes	No	Yes
Supported File formats	.doc, pdf, html, ppt, jpeg, gif, Audio, Video, etc	doc, pdf, html, postscript, jpeg, gif, etc	pdf, MS-Word, html, jpeg, etc,
License	GNU	BSD	GNU
Emblem	DSpace™		eprints.org
Associated Software	Jave, Apache, PostgreSQL, or Oracle	Apache, PERL, GNU C++ Compiler, JAVA, GNU Database manager	Linux or Unix, Apache, Perl

7. FINDINGS

This comparison of three major open source software based on certain parameters mentioned above has resulted into the following findings.

- DSpace is the most popular among the digital library solutions available in the open source domain and DSpace is functionally richer and supports a wide range of object types, including text, sound, images and video. It provides detailed implementation guidelines.
- GSDL and EPrints are also widely used and it is a low cost option for a repository primarily aimed at open access to article pre-prints and post-prints, including digital theses. A range of object types can be uploaded, including video, audio, images and zip files. Educational institutions dominate in the use of these packages.
- Institutions for which EPrints is not quite suitable may find DSpace and Greenstone more closely meets their needs, without being unnecessarily complex. India is benefiting well from the open source movement.
- DSpace supports community based content policies and submission process and accommodates various kinds of digital document formats.

- EPrints is a useful Digital Library system with large user community. But when there is a need for technical support and training in using the software, DSpace was found suitable.
- Though many libraries are using Greenstone and E-Print but the majority of the libraries prefer DSpace as it has got several advantages and can support numerous forms and formats. It was also noted that by using DSpace, there is a possibility of interacting with other libraries in the city for technical support. Moreover it is open source software and can be customized as per the institutional requirement.

8. CONCLUSION

The Open Archives Initiative has gained momentum since last few years. Open source software incorporates an interface that makes it easy for people to create their own library collections. From the results of the comparison/evaluation, it is observed that current open source DL software still lacks certain functionalities perceived to be important, as gathered from the literature. However, among the three, Dspace and Greenstone were able to fulfill most of all the vital indicators because of its strong support for end-user functionality. EPrints was yet another strong contender, which has the capacity to get better when it adds a usage monitoring and reporting feature in the next release.

EPrints did not fare well in the evaluation because it lacked strong support in certain areas, especially in the search category. However, it must be noted that each software package has individual strengths and weaknesses that will appeal to different organizations and stakeholders with different needs.

But when there is a need for technical support and training in using the software, DSpace was found suitable with numerous discussion groups to its credit. Though considerable number of libraries is using Greenstone and E-Print, the majority still continues using DSpace for obvious benefits discussed above.

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Digitization of Archives: A Radical Movement to Attain Knowledge for All

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Abstract: In an era of bursting of the bubbles of the portals and .com model, the digitization of libraries and rare documents is offering a new economy of services which not only includes locating the information resources but also the overall backend administration. The present communication presents the developmental work related to digitization of selected rare documents of Rajarshi Shahu Maharaj preserved by the Kolhapur Archives. These kinds of projects are more appropriate in Indian scenario as we have the most old and rich cultural heritage existing even today in the form of rare documents. It is imperative to preserve and propagate indigenous knowledge and culture existing in the form of rare documents and to save them from the ageing effects by digitization. Detailed methodology and the know-how developed have been discussed in the paper.

Keywords: Archives, Digitization, Camera, Indexing, Kolhapur

1. INTRODUCTION

Archives have a great deal of precious knowledge, which is important even in the modern era of information society. Recently from the experiences gained in demolishing of the archives (e.g. in Taliban Government) there is a pressing demand of their preservation by using the modern means from all over the world. Also there is a worldwide demand to liberalize the access to archives so that the researchers can study and compare them in the global context. Therefore a need is arrived to recall that records and archives are at the heart of the information society and distribute them in the electronic environment and ensure their preservation for future generations.

There are worldwide movements worth mentioning in order to preserve the archives and the ancient manuscripts. Considering the threats to the preservation of ancient manuscripts of Africa, there was formation of pan-African organisations to protect these documents and encourage African governments to pass legislation to ensure such protection [1]. For a similar cause the forum of Commonwealth national archivists and archival educators were formed in South Africa in September 2002. In India also the mission for preservation of the archives was started by establishing the National Archives headquartered at New Delhi and have branches located in four regions [2].

2. ORIGIN OF THE PROBLEM/RATIONALE BEHIND DIGITIZATION

The Kolhapur Archives maintains the rare documents mainly relating to the administration of the former Kolhapur state. There are around 40 Laks of papers as old as in AD1700 to till the latest in 1947. The papers are in different scripts such as Modi, Devanagari and English as well.

The Kolhapur archives maintains all these documents as their historical relevance is well known. Some of these documents are in the regime of respected Chhatrapati Shivaji Maharaj who led the foundation of the first of its kind of independent state ideologically known as "Hindavi Swarajya" in the history of India. The rare documents pertaining to Chhatrapati Shivaji Maharaj are preserved in what is known as "Bawada Daptar" of Kolhapur Archives. The succeeding rulers after Chhatrapati Shivaji Maharaj also contributed to the Hindavi Sawarajya. Amongst them the main rulers were

Maharani Tarabai. She took over after the sad demise of Chhatrapati Rajaram Maharaj when Chhatrapati Shahu was in prison. But due to various pressures and the prevailing public opinion, the moghal emperor Aurungazeb was forced to release Chhatrapati Shahu from prison. After the release of Chhatrapati Shahu the state was divided with two parts having namely Karveer and Satara. The entire historical evidences in the form of documents are found to be maintained at Kolhapur Archives.

The Kolhapur archives contain 53 rumals consisting of 15160 documents. It has also in its custody 73 files containing 8000 pages. The descriptive catalogue of Chhatrapati Rajarshi Shahu's records was compiled by distributing the work at three centers namely Bombay, Pune and Kolhapur.

Records created by Rajarshi Shahu Chhatrapati of Kolhapur in the period 1884-1922 are preserved at the following places

1. Kolhapur Archives, Kolhapur
2. Mumbai Archives, Mumbai
3. National Archives of India, New Delhi
4. Kolhapur Chhatrapati's Khsgi Daftar Khana at New Palace, Kolhapur
5. India Office Records and Library, London.

The publications of Kolhapur Archives are as follows:

- Konkananchy Itihaschi Sadhane
- Nikadi Daftaratil Kagadpatrianchi Suchi
- Parasnisi Daftaratil Kagadpatrianchi Suchi
- Chitinisi Daftaratil Kagadpatrianchi Suchi 1 Khand
- Descriptive catalogues of papers relating to Rajarshi Shahu Chhatrapati of Kolhapur, Volume 1 and 2.
- Rajarshi Shahu Maharjanchae Aadesh – 2 Volumes
- Chhatrapati Rajaram Maharajanchae Nivadak Aadesh Bhag 1

The documents selected for this project exhibit Rajarshi Shahu's personality from all the perspectives as an ideal ruler with lots of constraints.

3. METHODOLOGY

The methodology is expressed by using the flowchart as shown in figure 1:

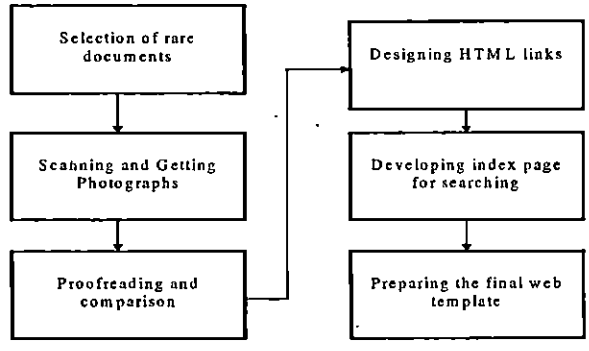


Fig. 1: Flowchart depicting the methodology of the project

3.1 Stage 1: Selection Of Rare Documents For Digitization

Selection for digitization is a difficult process having much in common with choice to acquire, microfilming, and withdrawal, and with other tactical decision-making that is vital to the work of libraries. The alteration of textual, visual, and numeric information to electronic form from preparation and adaptation to presentation and archiving include a range of procedures and technologies with widely varying insinuations and costs. The judgments we must make in defining digital projects involve the following factors: the intellectual and physical nature of the source materials; the number and location of current and potential users; the current and potential nature of use; the format and nature of the proposed digital product and how it will be described, delivered, and archived; how the proposed product relates to other digitization efforts; and projections of costs in relation to benefits [3]. In this project the rare documents of Rajarshi Shahu Daftar from Kolhapur archives are selected for the digitization. The age of these documents is more than 85 years and they are of immense importance for the researchers of history and social science in and around Kolhapur as well as for others.

3.2 Stage 2: Scanning / Photocopying

In order to undertake the digitization of the above mentioned documents, the next step is their conversion in electronic format. The scanning was undertaken by using the Minolta PS7000 scanner.

3.3 Stage 3: Proofreading And Comparison

In this step a comparison of the acquired images from both the methods was done in respect to the clarity, cost and ease of access.

3.4 Stage 4: Designing HTML Links

In this step the scanned/photographed documents were encoded into a special language read by Internet browsers so that they can be placed online. The electronic versions of the documents were coded in HTML so as to direct the browsers and other computers to read the information accurately.

3.5 Stage 5: Developing the Index Page

An index page with the overall listing of the document titles was completed so that the collection becomes searchable.

3.6 Stage 6: Final website

In this step the final website was completed for launching it on MS Windows platform.

4. CONCLUSION

The Kolhapur Archives maintains very important documentation, which has lots of significance from historical point of view. However, it was observed that the common man is unaware about this documentation. Although the staff at the Kolhapur Archive is very helpful in extending the information, there is reluctance on part of common people to visit this office and get information. Most of the people visiting this office were found to be interested in the rewards given by the royal family in terms of land.

Looking at the present socio-economic scene of the India, these documents are of para-amount importance as they evident the initiation of many welfare policies started by the rulers of Kolhapur state way back in sixties and seventies even upto the last century. This indicates the visionary approach of these rulers towards the common man and must be studies in the global context with the comparison

with the contemporary rulers all over the world. Many research investigations are in progress to achieve this goal.

However, the main hurdle in these investigations is the global availability of these documents in digital form, which can be shared by the researchers in this field. With the omnipresence of the internet and the World Wide Web it is quite but natural to take the benefit of this deeply rooted media to share the information. In order to facilitate this digitization of these rare documents was taken up and it was thought appropriate to build this as a digital repository for global interest. Digitization of other archives on similar lines and forming the knowledge portals would definitely bring about a radical change to attain the motto 'Knowledge for All' by which the LIS professionals can become the change agents in the present era of knowledge.

ACKNOWLEDGMENT

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Empowering Knowledge for All: Role of Digital Libraries

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Abstract: We discuss in the present paper about the role of digital libraries. The emerging field of digital libraries brings together participants from many existing areas of research. Currently the field lacks a clear agenda independent of these other area. It is tempting for researchers to think that the field of digital libraries is a natural outgrowth of an already known field. From a database or information retrieval perspective, digital libraries may be seen as a form of federated databases. From a hypertext perspective the field of digital libraries could seem like a particular application of hypertext technology. From a wide-area information service perspective, digital libraries could appear to be one use of the World Wide Web. From a library science perspective, digital libraries might be seen as continuing a trend toward library automation.

Key words: Digital Library, Electronic Library, Modern Library, Virtual Library

1. INTRODUCTION

Digital library is newly emerging perspective in the modern world. Apart from this view there is some truth to these perspectives (as well as others) but none address the field as a whole and its research agenda. The field of digital libraries will be limited if viewed only as a sub field of prior research interests. To realize its full potential, the field must be viewed as a union of sub fields from a variety of domains combined with additional goals, and thus new research issues. Digital library research must both respect the existing tradition of our physical libraries and transcend current practice in developing a new, broader research agenda.

What are the research issues central to digital libraries? One issue might be how to digitize objects and put them on-line. A second might be how to include new forms of information that do not have temporal or tangible representation necessary for inclusion into physical libraries. Another could be how to locate materials in the new digital library. Yet another would be when to use and when to transcend the existing technologies and traditions of the physical library in its digital form. Still other issues stem from the problems of information overload created by new information technologies. This framework presents for thinking about the field of digital libraries and the research issues that are part of it and demonstrates how these issues affect digital library systems.

The recent decades have witnessed tremendous advanced in information technology and its application. The latest technologies offer cheaper price computer processing power, mass storage inexpensive access to high speed networks and retrieval devices which gives us the ability to crate, manipulate, store and transfer large quantities of formation in digital form at low cost, electronics publishing and resource sharing activities have become very easy and convenient today. These major changes have led create and develop digital libraries. Digital libraries basically store of materials in electronic format and manipulate large collection of those materials effectively. The key technological issue is how to search and display the desired selections from and across e collections. The main focus of digital libraries should be on issues of access, cost and digitization technology and how to develop the necessary infrastructure for effective mass manipulation of the information network.

2. WHAT IS DIGITAL LIBRARY ?

Digital Library : This is a computer era. So, we can say that digitalization is the part of computerization. Digitalization means, there we can find the information through computer in digit form. Digital Library, a global virtual library, is a library of thousands of networked electronics libraries. There will be a vast population of users scattered around the globe, who are able to access, easily and conveniently, the complete contents of thousands of repositories containing texts, images, sound recordings, videos, maps, scientific and business data, as well as hypermedia combinations of these elements. The library must a network based distributed system with local servers responsible for maintaining individual collections of digital documents.

A digital library is a collection of digital objects. A collection of research papers is a typical example. When this collection gets sufficiently large, users of the digital library cannot examine each paper individually to find if its subject interests them. To address this problem, digital librarians create an interface to stand between the content of the collection and the user. In a traditional library, an example of this would be a card catalog – a collection of small cards that represent the larger objects contained in the collection. These cards are more manageable than the books that they represent. In a digital library, there are a number of ways that we can present the digital collection to the user The first thing that we need to do is to describe each object in a manageable way. This description is called metadata – data (the description) about data (the digital object). This metadata is more manageable than the digital objects that it represents. Metadata is written in a standard format. This allows the metadata to be manipulated using automated tools.

In the past, the problem had been involved in that digital libraries have been very expensive to develop. This is because people were programming them all from scratch. Lots of people and organizations have digital collections. Why should each digital library be a reinvention of the wheel? Another problem is interoperability. When many organizations have collections, users must search each one until they find what they need. What if the users could go to one place and look through lots of collections at once? For this to happen, the programmers that developed one digital library would have to talk to the programmers of the other library to get the collections to talk together. Then two digital libraries could interoperate, but what about all of the others? This is where the idea of Open Archives Initiative created a standard protocol, a way that collections provide descriptions about their contents. This is the basis for the creation of interoperable digital libraries. By standardizing the interface to the metadata, tools to work with this data can be created only one. Organizations that can't afford programmers can now have digital libraries, using these standard tools. Digital library is collection of standard tools using a standard interface and underlying protocol needed to create a digital library that is interoperable with other digital libraries.

The future of digital library history will be determined not by the technology involved, but by the ideology. If the will be determined not by the technology involved, but by the ideology. If the prevailing definition of a digital library is an organized searchable collection in digital format, then the future of digital libraries will reflect a move toward integrated service functions and collection development and management similar to the traditional library organization.

DEFINITIONS:

According to **Don Waters** defined that "Digital libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, distribute, preserve the

integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities"

"A Digital library is a machine readable representation of materials which might be found in a university library together with organizing information intended to help users find specific information. A digital library service is an assemblage of digital computing, storage, and communicating machinery together with the software needed to reprise, emulate, and extend the services provided by conventional libraries based on paper and other material means of collecting, storing, cataloging, finding, and disseminating information." **Edward A. Fox**

"Digital libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use a by a defined community or set of communities." Says **Digital Library Federation.**

3. CHARACTERISTICS OF DIGITAL LIBRARY

The characteristics of digital library discussed here as noted below:

- Users are usually elsewhere than the information they want, and often wish to correlate things from several sources.
- Whoever wants to use a library must show permission to do so
- Different patrons are permitted different actions and to see different parts of each collection.
- To find specific information, each user must understand the catalog structure.
- To find specific information, each user must understand the catalog structure.
- The catalog may describe items not actually held as part of the collection at hand.
- The catalog and the collected items are used differently and not necessarily housed in the same place.
- Documents are cataloged with text descriptors and also with conventional properties such as author names.
- Documents contain cross-reference to other documents.
- Document identifiers are different from document names.
- Translations of a document may express essentially the same information, e.g.. versions of classic literature in different languages.
- Each stored item is valuable, often with part of its residual value assigned by its authors originality or authors' assignees.
- Part of the value provided by a library is the provenance information it hold for each item.
- Item are put into libraries because, while each is thought valuable for futures reference, the specific individuals who will read it and the times when this will occur are not known.

3.1 Components of Digital Library

Digital library requires well-established and proven information technologies by accessing the database or servers through networks. The following components are very essentials to create digital library:

3.2 Hardware requirement

The noted below are the requirement of digital library as follows:

- 24 hours Internet connectivity
- Computer servers
- LAN or WAN
- Scanners
- Storage media: high power hard disk
- Wi fi tower and CDs
- Digital camera
- High power Ups
- Converters
- Networks
- Multimedia interfaces

3.3 Software

The software requirement of the DL as indicated below:

- Linux operating systems
- Digital library software like Greenstone and D-Space
- Editing software

3.4 Human ware

The key skills are required for digital library staff as indicated below:

- Management skills
- Technical Skills
- Subject Skills

4. OBJECTIVES OF DIGITAL LIBRARY

The objectives of digital library as mentioned here in:

- To collect, store, organize and access information in digital form via communication channels.
- To meet the requirements of patrons by providing better services.
- To provide personalized and retrospective services in efficient way.
- To have large digitized databases.
- To save time of library staff by avoiding routine jobs.
- To provide coherent view of all information within a library in any format.
- To serve widely dispersed communities throughout the network.
- To minimize massive storage and space problem of large libraries.
- To reduce cost involved in varies library activities.

5. FUNCTIONS OF DIGITAL LIBRARY

The main function of DL has been summarized below:

- Making available various types of knowledge resource.
- Providing resource discovery mechanisms that allow users to identify relevant or required resources and their locations.
- Providing mechanisms for delivery of specific resource to the user, delivery includes both obtaining a resource when it is not already available in the library and passing it on to the users in a suitable way.

The Cornell Reference Architecture for Distributed Digital Libraries (CRADDL) defines a number of core services of the digital libraries. They are:

- Repository service, where digital objects can be deposited and stored, and to which the digital library provided access.
- A naming service, which ensures that each digital object has a globally unique name and that this can be resolved into at least one physical location.
- An Index service, which enables sets of digital objects to be described and queries to be resolved into result sets containing unique names.
- A Collection service, which performs selection against defined criteria, tailored and specialized catalogues or other resource discovery aids and administrative process.

6. DIGITAL LIBRARY DEVELOPMENT ISSUES

There are many thousands of digital library projects currently underway, in all sectors of the library community. The basic concept underlying the digital library is not new. In 1945, Dr. Vannevar Bush of the U.S. Office of Scientific Research and Development discussed a device called a "memex". He envisioned this device being used by individuals as "a sort of mechanized private file and library".

Of these many terms, digital library, virtual library, hybrid library and electronic (or e-) library are most common. In the 1990s, terms such as digital library, virtual library and electronic library became widely used, but considerable uncertainty remains about what they actually mean.

A digital library is not confined to just digitize collection of rare materials. It should be built according to principles that are not necessarily the same as those employed for paper collections, and it should be valuated according to different measures that are no yet totally clear and not defined perfectly.

6.1 Digital conversion process

Digital conversion process, which includes

- Document
- Data capture
- Data Processing
- Storage
- Indexing and Processing
- Retrieval and display

Documents: In include text, bibliographic or full text, photographs, diagrams, charts, maps, colour images etc. They exist either in print or non-print form or also as single unit or collection.

Data Capture: It includes manual data entry (word processing), optical character recognition (OCR) or imaging using scanners.

Data Processing: The text in the convertible document may require conversion of diacritics or special characters: images may need enhancement, amplification or compression. In many cases a simple conversion from print to digital is not enough.

Storage: The digitized information needs to be recorded in proper digital storage medium, which may be hard disk, magnetic tape, optical CD-ROM, or networks with workstation to access.

Indexing and Processing: Digitized document need to be processed using standards, protocols and indexing systems. Classification using library system also hold much promise. Metadata application should be a major component of the digital information processing.

Retrieval/Display: It is the process through which an array of technologies for browsing, displaying, and applying packages that ultimately helps in access.

6.2 Merits of Digital Library

The main advantage of the DL as indicated below:

- Helps in Resource sharing facilities.
- It saves the library manpower and funds.
- Helps in inter-library loan (ILL).
- Helps to reach information of their users at faster rate through on-time communication.
- It minimizes the duplication of new invention.
- Helps the Libraries to get recent publications from the publishers.
- Researchers! Information Scientists will get information with minimum time.
- Helps to get bibliographical information, retrospective search, union Catalogue, Abstracting and indexing of periodicals.
- On-line library catalogue through internet gives access to bibliographic records of millions of books and details of holdings of academic and research libraries, e-journals and newsletters.
- E-publications provide aids for connectivity, audio visualization, customizability, creation and revision of documents, interactivity and rapid information retrieval.
- E-publications may help in overcoming the restrictions on the length of the paper imposed by many scholarly journals.
- The E-publications data can be maintained up-to-date so hat the buyer will be able to purchase the latest version of the publications. This enables on demand publishing and allows retrospective searching and SDI.

6.3 Demerits

Digitizing of information does help a great deal. However, there are problems for handling and using these large volumes of digitized information. Digital and Electronic libraries are also not without their limitations. Few of these are:

- Compatibility and standardization problems are likely to be faced due to the use of a variety of hardware, software, information collection, and storage and retrieval methods.

- A problem frequently encountered and difficult to overcome will be the one of copyright and intellectual property issues.
- This phenomenon is faced because electronic information is more easily manipulated and reproduced and the identity of the author or changes affected to original data is harder to establish.
- The unrelenting invasion of the viruses will pose another ethical risk.
- Changing habits in the arena of learning and teaching is also another problem browsing on the digitized form is difficult when compared to printed form remote access to documents are uncomfortable when compared to spot accesses a disappearance of nascent information in internet.
- Problems in the scholarly publishing
- Some documents are used only when it is seen
- Inadequacy of the libraries to predict the future use of documents, irrespective of its type i.e. printed or digital.
- Locating the information on the internet requires good skills.
- Problems of intellectual property rights of the author and publisher, etc.
- There is the problem of health hazards associated with the use of computers e.g. eye and back problems as well as the exposure of radiation from monitors.
- There will be a necessity to be proficient in computer usage and keep abreast of the state-of-the-art in the field, if they wish to retain an edge in the provision and utilization of information services.
- Librarian like professionals perceive a threat to their jobs posed by computers which can presumably takeover their functions with greater efficiency and will resist the move towards complete computerization.
- The emphasis on consistently upgrading skills and the yawing gap between information rich and poor will give way to such new social problems as technophobia and this will initiate a new battle in the users.

7. CONCLUSION

The above paper discussed the role of digital libraries and its main functions, tools and technologies used for data capture or content creation and management of publication. We also pointed out the technical and non-technical factors affecting the many technologies such as VRBA, LBC, Cryptolope and trusted system. We also enumerated the merits and demerits of digital library with high point of view. The emerging of Information Technology with high resolution capture and sophisticated engines and large storage digital contents continue to ability of conform the digital library and at the end topic we can say that digital library is paperless library, everything found in digitization form in digital library. Digitization has transformed the methods of creating, processing, archiving and disseminating information and knowledge resources. This new dimension has changed the scope of libraries and their users,

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Harmonization of Standards for Bibliographic Data and Metadata Representation

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Abstract: Standards for bibliographic data representation are essential for data exchange between libraries. MARC21 is gradually being accepted as the standard by libraries in many countries around the world if only for reasons such as economic and following popular market trends. However, for representation of electronic, Internet and Digital library resources several metadata standards such as Dublin Core and Metadata Object Description Schema (MODS), ONIX are followed. MARC21 is a matured standard by virtue of experience and many of the recent metadata standards are often cryptic subsets of the MARC elements. Paper discusses firstly, the developments that led to the harmonization of various flavors of MARCs into the MARC21. It further discusses harmonization of MARC 21 for generating metadata required for representation of resources on Internet and Digital repositories. Several useful tools and techniques that have emerged to create crosswalks between MARC and metadata standards are outlined.

Keywords: Bibliographic Standards, Metadata Standards

1. INTRODUCTION

Machine Readable Catalogue (MARC) was first introduced at the Library of Congress in the 1960s. Most library automation projects in India have concentrated first on making machine readable catalogues. The advantages of MARC are many such as:

1.1 MARC

- Provides search facility added to browsing
- Facilitates easy management of data as it uses Database Management Systems (DBMS).
- Facilitates easy exchange of bibliographic data among libraries
- Advocates standardized data representation and record format

However, MARC brought in a few complications. With increasing awareness of MARC, libraries in many countries tried to make their MARC but found that they had to make certain changes to use it to suit their local needs and practices. Hence there came many flavors of MARCs, popular ones being the UKMARC in Britain, CAN/MARC in Canada and others in Australia and Africa. Hence MARC which was proposed to be a standard for bibliographic exchange could not really be universally used as such because there came to be too many standards based upon it. IFLA proposed the UNIMARC (UNIversal MARC) as a solution to the problem. UNIMARC was used by the libraries that started their MARC project then and that too only used by smaller libraries. But there was no move to merge or convert all existing MARC into the UNIMARC format. Hence UNIMARC too remained as just another MARC. A major move however was the emergence of MARC21 in 1999. MARC21 is the harmonized standard emerging from the USMARC and the CAN/MARC. Both US and CAN/MARCs worked for several years to eliminate the differences in the formats and made fully compatible in the harmonized form called MARC21, the '21' signifies moving into the twenty first century and also achieving a true world wide use of the standard. The emerging scenario is that majority of the countries are now following MARC21 for reasons such as internationally available

systems, like the OCLC data, are using the MARC21 format. Also MARC21 is supported as rather a default standard by software vendors and any required deviation by individual libraries include additional costs. Factors such as these go in favor of MARC21 to be universal standard in the future.

2. STANDARDS INFLUENCING MARC21

There is mainly a two part standard followed by MARC21:

2.1 Standard rules for data content:

MARC21 uses mostly the AACR2 cataloguing rules for data extraction for all kinds of data such as Bibliographic, Authority, Holdings, Classification, and Community Information.

2.2 MARC21 Record structure

Like the many other national MARCs, MARC21 follows the ISO-2709 (ANSI z39.2) standard for representation within bibliographic data management packages. However, it should be noted that there is shift towards XML and in near future more and more records will be in MARC-XML record structure.

3. MARC AND INTERNET

Internet has had significant impact on all activities of libraries and library OPACs were one of the first products that generated interest of the user communities. And with the web interfacing to library OPACs they were transformed into WEBPACs where the catalogues could be browsed by users worldwide. However, on the technology side there were developments to make available the MARCs on web which resulted in the MARC-XML, regarded as a specification for authoring web based MARCs. The Library of Congress' Network Development and MARC Standards Office have partnered to develop a framework for working with MARC data in a XML environment. The framework would be flexible to allow users to work with MARC data in ways specific to their needs. The framework contains many components such as schemas, stylesheets, and software tools developed and maintained by the Library of Congress. MARC data can be represented in XML in two ways:

a. Using MARC numeric content designators along with subfield identifiers and indicators
b. Can be represented as alphabetical content designators like author, title etc. However this approach may result in lossy data with transforming.

MARC-XML could potentially be used as follows (1) for representing a complete MARC record in XML

- as an extension schema to METS (Metadata Encoding and Transmission Standard)
- to represent metadata for OAI harvesting
- for original resource description in XML syntax
- for metadata in XML that may be packaged with an electronic resource

3.1 Advantages of MARC XML

Some MARC XML advantages are: (2)

- The schema supports all MARC encoded data regardless of format
- The MARC XML framework is a component-oriented, extensible architecture allowing users to plug and play different software pieces to build custom solutions

- It enables lossless conversion from MARC to XML and vice versa
- MARC Editing — single or batch updates such as adding, updating, or deleting a field to a MARC record can be accomplished with simple XML transformation
- Validation with this schema is accomplished via a software tool. This software, external to the schema, will provide three possible levels of validation:
  - Basic XML validation according to the MARC XML Schema
  - Validation of MARC21 tagging (field and subfield)
  - Validation of MARC record content, e.g., coded values, dates, and times.
- Data Conversion: Most data conversions can be written as XML Transformations (XSLT). For more complex transformations of the data, software tools which read MARC XML can be written
- Extensibility: By using XML as the structure for MARC records, users of the MARC in the XML framework can more easily write their own tools to consume, manipulate, and convert MARC data

3.2 MARC and Dublin Core

Dublin core is widely accepted as a simplistic set of metadata elements for description of electronic and online resources. A mapping between the elements in the Dublin Core and MARC fields is necessary so that conversions to Dublin core metadata can be extracted from existing MARC21 data. The basic Dublin Core style metadata might interact with MARC records further in various ways such as the following (3):

Enhancement of simple resource description record: A cataloging agency may wish to extract the metadata provided in Dublin Core style (presumably in HTML or XML) and convert the data elements to MARC fields, resulting in a skeletal record. That record might then be enhanced as needed to add additional information generally provided in the particular catalog. *Example:* Retrocon projects to convert data and use as basic record for compilation of a national bibliography.

Searching across syntaxes and databases: With the proliferation of several syntaxes and methods for providing metadata, it will be important for systems to be able to search metadata in different syntaxes and databases and have commonality in the definition and use of elements. MARC can provide as an essential via media for the searching across variant descriptions.

3.3 Example of DC metadata extracted from MARC data

Original MARC record:

01904cas 2200433 a

45x0001001300000003000600013005001700019006001900036007001500055008004100070010001700111040003000128042000800158043001200166074001100178086001300189049000900202130005300211245006800264246005600332246004300388246005300431246004200484260007400526300005400600310001400654500007500668515003200743530021300775538010300988650003901091710002901130776009301159776008800125277600930134085000100143393600150144399400120145 8 ocm38075790 OCoLC 20020625222012.0 m m f coucgu———— 971212c19uu9999vau x m s

ocm38075790 OCoLC 20020625222012.0 m m f coucgu———— 971212c19uu9999vau x m s f0 0eng d -asn 99031563 -aUMC-cUMC-dIUL-dHUL-dOCLCQ -alcd -an-us—- -a0624-H 0 -aI 19.76: -aOREU

0 -aU.S. Geological Survey open-file report (CD-ROM) 00-aU.S. Geological Survey open file report-h[electronic resource]. 1 -iTitle on spine of container:-aUSGS open-file report 1 -iTitle on disc label:-aOpen-file report 2 -aUnited States Geological Survey open-file report 3 -aUS Geological Survey open-file report -a[Reston, Va.?] :-bU.S. Dept. of the Interior, U.S. Geological Survey, -acomputer laser optical discs :-bcol. ;-c4 3/4 in. -aIrregular -aDescription based on: 92-478; title from analytical authorship screen. -aSome no. issued in 2 discs. -aIssued also in online, videocassette, and microfiche editions; in a print ed. as: Open-file report (Geological Survey (U.S.)); and in a diskette ed. as: Open-file report (Geological Survey (U.S.) : Diskette). -aSystem requirements: CD-ROM drive; hard-disk drive; color monitor; other system requirements vary. 0-aGeological surveys-zUnited States. 2 -aGeological Survey (U.S.) 1 -tOpen-file report (Geological Survey (U.S.))-x0196-1497-w(DLC)sf 95011962-w(OCoLC)5752564 1 -tU.S. Geological Survey open-file report (Online)-w(DLC)sn 97038359-w(OCoLC)38116130 1 -tOpen-file report (Geological Survey (U.S. : Diskette)-w(DLC)sn 99033488-w(OCoLC)41306956 -aMH-GS -a98-774 LIC -aX0-bORE

MARC converted to DC record:

<?xml version="1.0"?>

<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:dc="http://purl.org/dc/elements/1.1/">

<rdf:Description>

<dc:title>U.S. Geological Survey open file report [electronic resource].</dc:title>

<dc:creator> Geological Survey (U.S.) </dc:creator>

<dc:type>text</dc:type>

<dc:publisher>[Reston, Va.?] : U.S. Dept. of the Interior, U.S. Geological Survey,</dc:publisher>

<dc:language>eng</dc:language>

<dc:description>Description based on: 92-478; title from analytical authorship screen.</dc:description>

<dc:description>Some no. issued in 2 discs.</dc:description>

<dc:description>System requirements: CD-ROM drive; hard-disk drive; color monitor; other system requirements vary.</dc:description>

<dc:subject>Geological surveys</dc:subject>

<dc:relation type="original">Issued also in online, videocassette, and microfiche editions; in a print ed. as: Open-file report (Geological Survey (U.S.)); and in a diskette ed. as: Open-file report (Geological Survey (U.S.) : Diskette).</dc:relation>

<dc:relation>Open-file report (Geological Survey (U.S.))</dc:relation>

<dc:relation>U.S. Geological Survey open-file report (Online)</dc:relation>

<dc:relation>Open-file report (Geological Survey (U.S. : Diskette)</dc:relation>

</rdf:Description>

</rdf:RDF>

3.4 MARC and MODS

The "Metadata Object Description Schema" (MODS) is an XML schema for a bibliographic element set that may be used for a variety of purposes, and particularly for library applications. MODS is jointly developed by The Library of Congress' Network Development and MARC Standards Office with participation of interested experts. MODS is intended to be able to carry selected data from existing MARC 21 records as well as to enable the creation of original resource description records.

MODS elements generally inherit the semantics of MARC elements. However, certain similar fields have been clubbed into generic elements for example MARC tags 130, 240, 730 are all linked to MODS element <<title type="uniform">>. MODS does not assume the use of any specific cataloging code. Several elements have an optional ID attribute to facilitate linking at the element level. However, while a crosswalk from MARC21 to MODS is possible but the reverse conversion may not be accurate. (4)

3.5 MODS XML representation

A MODS instance may consist of a single MODS record or a collection of MODS records. In the case of the single record, <mods> is used as the root (first) element. In the case of a collection, <modsCollection> is used as the root element, with <mods> as the secondary element that introduces each separate MODS record contained in the collection.

The scheme declaration for MODS is:

<mods xmlns:mods: "http://www.loc.gov/mods/">

or if using "mods" as a prefix to each element:

<mods: mods xmnls:mods: "http://www.loc.gov/mods/">

3.6 Advantages of MODS

MODS are intended to complement other metadata formats. Some of the advantages of using MODS are (5):

- The element set is richer than Dublin Core
- The element set is more compatible with library data than ONIX
- The schema is more end user oriented than the full MARCXML schema
- The element set is simpler than the full MARC format

3.7 Sample MODS data

<?xml version="1.0" encoding="UTF-8" ?>

- <xsd:schema targetNamespace="**http://www.loc.gov/mods/**" xmlns="**http://www.loc.gov/mods/**" xmlns:xsd="**http://www.w3.org/2001/XMLSchema**" xmlns:xlink="**http://www.w3.org/TR/xlink**" elementFormDefault="**qualified**" attributeFormDefault="**unqualified**">

<xsd:import namespace="**http://www.w3.org/XML/1998/namespace**" schemaLocation="**http://www.w3.org/2001/xml.xsd**" />

<xsd:import namespace="**http://www.w3.org/TR/xlink**" schemaLocation="**http://www.loc.gov/standards/mets/xlink.xsd**" />

```
- <!—
Root Definition
—>
 <xsd:element name="mods" type="modsType" />
- <xsd:element name="modsCollection">
 - <xsd:complexType>
  + <xsd:sequence>
 <xsd:element ref="mods" maxOccurs="unbounded" />
 </xsd:sequence>
 </xsd:complexType>
</xsd:element>

   ****** Top Level Elements *******
 —>
- <xsd:complexType name="modsType">
- <xsd:sequence>
 <xsd:element name="titleInfo" type="titleInfoType" maxOccurs="unbounded" />
 <xsd:element name="name" type="nameType" minOccurs="0" maxOccurs="unbounded" />
 <xsd:element name="typeOfResource" type="typeOfResourceType" minOccurs="0"
maxOccurs="unbounded" />
 <xsd:element name="genre" type="genreType" minOccurs="0" maxOccurs="unbounded" />
  <xsd:element name="originInfo" type="originInfoType" minOccurs="0"
maxOccurs="unbounded" />
   <xsd:element name="language" type="languageType" minOccurs="0"
maxOccurs="unbounded" />
 <xsd:element name="physicalDescription" type="physicalDescriptionType" minOccurs="0"
maxOccurs="unbounded" />
 - <xsd:element name="abstract" type="unstructuredText" minOccurs="0"
maxOccurs="unbounded">
 </xsd:sequence>
 </xsd:complexType
```

3.8 ONIX and MARC

ONIX stands for Online Information eXchange. It is a standard format used by book publishers for communicating book product information electronically. ONIX was developed as a solution to two particular problems: (a) the need for richer book data online and (b) the widely varying format requirements of the major book wholesalers and retailers. ONIX was developed by the American Association of Publishers (AAP) together with the major wholesalers, online retailers, and book information services to create a universal, international format for book information exchange. A

mapping of elements for ONIX to MARC21 elements is compiled as shown in the table below. And a separate 'record builder' used to create a full MARC record from the ONIX data was created by Bob Pearson of OCLC (6).

Table1: Mapping of ONIX to MARC21 (7)

ONIX tag	*ONIX Reference Name*	*MARC 21 Data Element / Comments*
<b028>	<DistinctiveTitle>	245 $a
<b036>	<PersonName>	100/700 I1 = 1; I2 = # ; $a (See the MARC record builder for more information about coding the 100/700 fields)
<b056>	<EditionTypeCode> (R)	250 $a (Code may be connected to a word)*
<b057>	<EditionNumber>	250 $a*
<b058>	<EditionStatement>	250 $a*
<b081>	<PublisherName>	260 I1 = #; I2 = 2; $b
<b083>	<CountryOfPublication>	008/15-17***; 260 $a [S.l.]; 044 $c

4. CDS/ISIS AND MARC COMPATIBILITY

ISISMarc is basically a data entry interface for CDS/ISIS databases that work on Windows and it is meant to replace the standard Winisis data entry window with a more powerful environment. The software was developed in co-operation with the Library of Congress (USA) (8).

As its name implies ISISMarc is particularly adapted for handling MARC-like formats, namely MARC21, UNIMARC, etc. However it can be used with any other CDS/ISIS database very easily. The main features of the ISISMarc software are:

- Multi-user capability (for local area networks)
- has independent and multi-lingual worksheets definition
- allows single subfields units data entry, each one with a complete description
- allows multiple subfields data entry
- totally customisable
- handling of authority files as external data bases
- field or even subfield level user-help links
- supports record validation through CDS/ISIS format
- supports cross-data base copy/paste of records
- supports Begin and End edition automated operations
- built-in characters editing capabilities (uppercase to lowercase, etc) and give access to Windows' character map
- supports multiple users' profiles
- global view of the record (through CDS/ISIS formats)

5. CROSSWALKS FOR MARC

MARC was designed for bibliographic data representation and to facilitate data exchange. However, with the advent of Internet and the emergence of the digital library movement, information

professionals have to deal with worldwide repository of information resources. Resource description methods have been analyzed and re-modeled into metadata standards for electronic and online resources. Accordingly several standards have cropped up including the Dublin Core, ONIX, MODS, etc. MARC standard has also adapted to the new challenges by making necessary extensions such as the field 856 for description of Internet resources. More importantly there is enough experience in the design and content of MARC that the new standards use MARC records as a basis to extract data. Basically, MARC data is too verbose with many fields and Internet metadata standards such as Dublin Core are more cryptic and only a small subset of the MARC elements. Hence utilities and tools are developed to efficiently map the MARC fields to extract elements according to other standards essentially enabling 'Crosswalks' between MARC and other standards. For retro-conversion on web XSL style sheets are written for transformations.

5.1 XSLT transformations

XSL is a member of eXtensible Stylesheet Language (XSL) family of languages, which are used to transform XML document and make it presentable for the web or other applications. It has three parts (9):

- XSL Transformations (XSLT): A language for transforming XML
- XML Path Language (XPath): An expression language used by XSLT to access or refer to parts of an XML document.
- XSL Formatting Objects (XSL-FO): An XML vocabulary for specifying formatting semantics

5.1.1 Applications of XSLT:

Possible XSLT applications are many

5.1.2 Data representation for Browsers

XSLT can be used for transforming an XML file into HTML format for display on a browser. It works as CSS (Cascading Style Sheet) for XML documents. With XSLT one can decide what data should be displayed on the browser and which kind of formatting should be applied to which element.

5.1.3 Compatibility Formats

Same XML file can be presented in formats depending on the requirement. It has a wide application in electronic publishing. Same website can be presented either to a WAP (Wireless Application Protocol) based browser or to a HTTP (Hyper Text Transfer Protocol) browser

5.1.4 Crosswalks for Retrospective Conversion

Changing data from one standard to other standard requires mapping of the elements between two standards. XSLT is an easy way to transform data from one bibliographic standard to other. Several crosswalk maps are available on Internet, which could be easily codified in XSLT statements for transformation. These transformations can be used for user level customized display of data. For example, several crosswalk XSLTs are available with MarcEdit like MARC to MODS, MARC to DC etc.

5.2 Tools

To ensure easy MARC transformations there are several handy tools available. MARCedit is one such useful tool. MarcEdit is designed by Terry Reese of Oregon State University, USA. Originally, the utility was designed for correcting the data entry mistakes in the catalog of Oregon University.

Currently, MarcEdit is in version 4.5 and an efficient tool for metadata crosswalk. MarcEdit is developed on Windows platform and it runs on any version of Windows.

5.2.1 Editing of MARC Records

MarcEdit includes Marc tool with the following modules:

- MarcBreaker
- MarcMaker
- Marc-MarcXML

MarcEdit provides a mechanism to edit MARC records. MARC records can be edited using any native editor.

It converts native MARC format file to editable Mnemonic format using MARC tools using MarcBreaker and MarcMaker, respectively. Similarly, XML format of the records can be generated using MARCXML and XML MARC, respectively.

5.2.2 UNICODE Compatibility

MarcEdit is UNICODE compatible. It can convert MARC-8 records, which is native MARC format to code multilingual characters, i.e. to UTF-8. It can read and write UNICODE code characters, thus Indic scripts can be used in data manipulation. But once the data is entered in UTF-8 it can't be changed to MARC-8 character set.

5.2.3 Import/Export

It can import and export records in XML or in MARC format. One can export any selected MARC records. Besides particular fields of MARC records can also be exported using the '*Export Tab Delimited Record*' utility.

5.2.4 Z39.50 Client

MarcEdit has Z39.50 client to search Z39.50 server. MarcEdit has listed a number of Z39.50 servers but one can edit the server list and add new ones. So far UNICODE is not implemented with Z39.50 client i.e. one cannot use UNICODE characters in the search expression. But if search result contains a UNICODE character, that can be handled by MarcEdit.

5.2.5 Available Transformations or Crosswalks

Several transformations are available with MarcEdit 4.5. It uses XSLT plug-ins for data transformations. These plug-ins are XSL stylesheets, which generate an XML file as output. MarcEdit has following in-built transformations:

- MARC à Dublin Core
- MARC à EAD
- MARC21XMLà MODS
- MARC21XMLà OAI Dublin Core
- MARCàRDFDC

All outputs are in XML format.

6. MARC21 IN DIFFERENT LANGUAGES

Presently, MARC21 is available in Catalan, Finnish, French, German, Hungarian, Korean, Norwegian, Portuguese, Russian, Spanish and Swedish. In the Indian context, the diversity of ethnical and linguistics communities poses a great challenge for data representation. For sheer economic reasons, India should adopt MARC21 and think of bringing MARC21, in native languages to facilitate creating MARC records in all the officially recognized languages. This should not be difficult as the Library of Congress generally encourages translations of MARC21 to various languages of the world.

6.1 Character Set

Until recently the MARC records have been using 8-bit based encoding system, which is generally known as MARC-8. With the advent of Unicode, there is marked shift towards UTF-8, as this is ASCII compatible. However, future system may incorporate 16-bit encoding.

Use of the Universal Coded Character Set (UCS or ISO/IEC 10646) and its subset Unicode have been approved for standard interchange of MARC 21 records. The related specifications deal with optimizing the interchange of data encoded using the MARC-8 character sets and UCS/Unicode during the transition from a largely 8-bit environment to the 16-bit UCS/Unicode environment (10).

7. CONCLUSION

Although Z39.50 servers work using MARC data in ISO 2709 record structure, with the advent of XML, these servers are providing facility to deal with MARCXML. For example, Yaz toolkit Zservers handle MARCXML. The main advantage of MARCXML is that XSLT rules can be written so that a library which intends to download data can transform the metadata on-the-fly to any other MARC format like UNIMARC or CCF, etc provided the XSLT rules provide a mapping of content designators (tags) from the Zservers to local format. Presently, the DRTC is developing a Z39.50 client to facilitate such transformations.

In essence, the Indian libraries should have already set up Z39.50 servers to facilitate bibliographic data exchange and to realize library networking it is time that libraries should implement MARCXML on Z39.50 servers.

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ICT Facilities and Services at Virtual Learning resource Centre in Gulbarga University Library

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Abstract: Attempts have been made to highlight the State-of-the-Art ICT facilities and services at Virtual Learning Resource Centre and Digital Library (VLRC&DL) established at Gulbarga University Library to keep pace with time and advances in information technology. The Virtual Learning Resource Centre and Digital Library comprises of 100 workstations, Main frame servers and CD NAS server, provides access to Internet, CD-ROM Databases, instructional learning materials and e-learning packages. Significance of this VLRC&DL in meeting the technology based information resources and services to support for knowledge management are explored. ICT based information services, UGC INFONET/INFLIBNET resources, Videoconferencing and user instructional programs organized by the Library for effective knowledge management are highlighted. Efforts made towards developing various databases, e-Learning materials, Academic Commons Software, Indigenous e-resources and network architecture are detailed.

Keywords: Virtual Learning Resource Centre, Digital Library

1. INTRODUCTION

Information and Communication Technology has become one of the basic tools and core of modern society in general and education in particular that adds to the value of learning, research and extension activities. Developments in Information and Communication Technologies (ICT) have not only changed the way information is generated, organized, stored and distributed but more importantly have become indispensable tool for teaching, learning and research. Knowledge sharing is a common goal for Knowledge Management (KM) and this calls for effective use of Information technology by Library and Information Centres. The National Knowledge Commission[1] (2005) insists all libraries must have the facilities — "motivated, courteous and adequate staff, easy access and user friendly retrieval system, effective signage's and computers with internet access and photocopiers", serving as a major vehicle to facilitate creation of knowledge, facilitating optimal use of knowledge by all sectors, and easy access to knowledge relevant to their needs. Further, in view of the complex information needs of the society and for better education and research among educational institutions, colleges and universities, the library and information centre have to play a greater role in building, developing and disseminating information products by establishing Learning Resource Centre. In the light of changing needs of users, to ensure quality improvement in teaching and learning insisted by NAAC[2] and the recommendations of National Knowledge Commission, Gulbarga University Library established the Virtual Learning Resource Centre and Digital Library in strengthening the information base to support academic and research activities.

2. GULBARGA UNIVERSITY LIBRARY: A STATE-OF-THE ART ICT FACILITIES

Gulbarga University established during 1980 is emerging as one of the leading centers of academic excellence catering to the educational needs of the society located in the backward region of Hyderabad

Karnataka. Within a short span, the University has achieved marvelous academic and research excellence resulting in four stars accreditation by the NAAC with 39 Post-graduate departments and P. G. Centres at Sandur, Bellary, Raichur and Bidar. Silver Jubilee of the university was inaugurated by His Excellency Dr A.P.J Abdul Kalam, President of India during September 2004.

The **Gulbarga University Library,** a knowledge Center for accessibility has been making sincere efforts to assure an environment for intellectual inquiry, providing user focused services by adopting the developments in ICTs to meet the knowledge management needs of the academics. The ICT Infrastructure facilities available in the Gulbarga University Library to provide e-information services are shown in Table 1.

Table 1: State-of-the-Art ICT facilities

Infrastructure	*Specification*	*Quantity*
Personal Computers	P-IV Lenova, Compaq and PCS and Laptops	135
Main Frame Servers	Dell™ Power edge (TM) 2900 Quad Core Intel® Xeon® E% 310, 2x4MB Cache Server	3
CD NAS Server	2084 MB memory, DVD writer drive, 500 GB SATA Hard Disk Drive	1
High End Scanner	PS 7000 Minolta	1
Digital Network Printers	Phaser 4510	3
Videoconference Units	Draper Baronet Remote Mt of Videoconference/LCD units	1
Bar Code Printer (1) & Laser Guns (2)	TLP2844 Printer , Heron D130	4
Software's		
Libsys	Libsys 4 standard edition software	1
Windows Advance Server and Fedora	Advance Server 2007	1
McAfee Anti-Virus Software	McAfee Active Virus Scan Enterprise Media Pack 103 user License	1
MS-OFFICE	100 user license	1
Open Source Software's -	DSpace and SQUID proxy	1
SPSS	10 user License	1

The Server Client architecture and network layout of Gulbarga University Library is shown in figure 1.

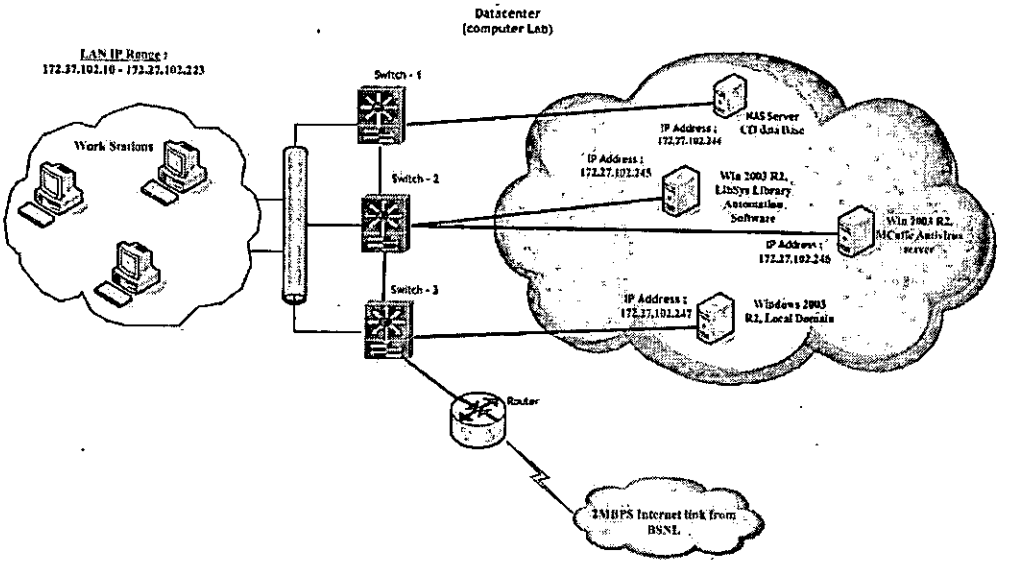


Figure 1: Network Architecture Layout of VLRC&DL, Gulbarga University, Gulbarga

2.1 Virtual Learning Resource Centre and Digital Library (VLRC & DL)

Virtual Learning Resource Centre and Digital Library (VLRC & DL) supported by UGC, New Delhi, and Infosys Foundation, Bangalore with an objective to accomplish the universal access unrestricted by time and place in order to harness the ICT for enhancing quality of teaching and research, as an extension of the university library has been established.

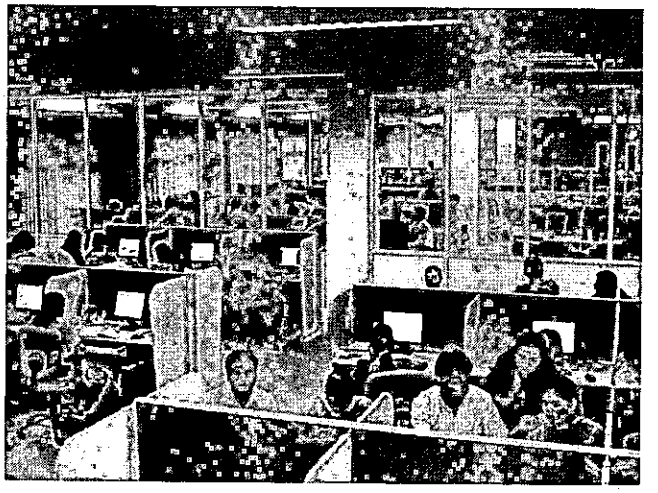


Figure 2: Virtual Learning Resource Centre & Digital Library

The State-of-the-Art computer facilities in VLRC&DL are supported by Infosys, Bangalore wherein 100 workstations, three Mainframe DELL Servers and CD NAS server to provide excellent access to Internet, CD-ROM Databases and e-learning packages using leased line for the benefit of students, research scholars and faculty. Access facilities for e-learning materials of different subjects with pleasant interior and air condition provide ideal learning opportunities. About 4500 electronic journals and databases are being accessed under UGC Infonet consortia in addition to sixteen Abstracting databases like BIOSIS, INSPEC, DAI, ABI/INFORM, LISA, ERIC, Sociological Abstracts, EconLIt etc subscribed by the university. These databases along with book CDs are accessible under network, which are hosted on CD/NAS server creating images of the databases. Information Resource Centres on Hyderabad Karnataka Development, Competitive Examinations and Career Development; Reserved collection on various subjects and epoch making personalities; Academic Commons; Institutional repositories and other unique facilities are a few IT-enabled knowledge management initiatives established in the VLRC&DL for the benefit of faculty and research scholars.

2.2 "Manthana" and "Samvad"– Training/ Videoconferencing Centre

"Manthana" - the Training/Videoconferencing Centre has been established in the library for conducting training programs on e-learning, e-resources, ICTs and facilitates Videoconferencing providing a platform for interactive lectures, demonstrations, educational films and other e-resources for the academics. Specialized online lectures are being organized from different experts of varied subjects for the benefit of students and research community. During May 2008, this facility was also used for interviewing about 15 MBA students by a Corporate Company, Bangalore. Besides "Samvad" a Discussion hall established, facilitates to organize need based specialized programs on ICT, e-learning and capacity building for small group (15 - 20 persons) of Academicians, Senior Management Executives and Administrators, which aims at skills development and support in educational planning, technology and development through various programs using creativity, brain storming, inter-active, collaborative and other teaching learning methods.

2.3. Academic Commons – Software Tools

Important software's, e-books, CD/DVDs and manuals for academic and research work by the Faculty and Students can be used in the centre. Data analysis, trouble shooting, network architecture, soft copies of various documents are provided in the centre. Users can work on some of the software for data analysis and research results from the VLRC&DL and Academic Commons. Assistance provided for e-resources search, software sensitization and downloading and Network Digital printing facility available on a nominal fee. Important software's especially SPSS, e-books, CD/DVDs and manuals for academic and research work by the Faculty and Students can be used in Academic Commons Centre. Data analysis, trouble shooting, network architecture, soft copies of various documents are also provided in the centre. Efforts are on to procure software's for various applications in Science Labs for analyzing research data.

2.4 Network Management

For effective management of the network, Static IPs have been created with login and password for the user's community working Windows 2003/2007 Advanced Server platform. McAfee Anti-virus enterprise edition of 103 licenses has been installed under the network for information security and blocking the unwanted information available on the Internet. Printing facility is extended to the users using Network printer on a nominal fee.

2.5 Digitization of Rare Materials and Indigenous Databases and Research Productivity

Political, cultural, economical, social and developmental information of the Hyderabad Karnataka region under the purview of Gulbarga University are being developed so that local information on all aspects is available in the library for the benefit of region/ society. More specifically the rare archival materials are being digitized using Minolta PS 7000 Scanner and interface is developed giving link under campus intranet. Also, research productivity of teaching faculty and Research Scholars in the form of books, journal articles/ conference papers, research projects are in the development stage and in this connection, Linux Version 8.0 and DSpace have been installed for establishing institutional repository.

2.6 Information Literacy Programs

User Education/orientation, sensitization/awareness and information literacy are the integrated programs conducted by Library at regular intervals separately for the students, research scholars, teaching faculty and administrative staff with a motto to promote use and acquaintance of e-resources, learning materials, UGC Infonet e-resources, CD/DVD Databases, research communication, presentation skills, information exchange and online access to Internet and web resources. User focused training Programs of a weeks duration on Research Communication and Information Management for the Faculty of Social Sciences, Arts, Law, Education, Commerce and Management and for faculty of Science and Technology were organized. Over 210 Research scholars and faculty members participated in these programs. Topics on research planning, ICTs and E-resources, Internet, E-communication Discussion forums, Data Analysis packages, citation patterns, thesis/ dissertation writing, technical paper writing, UGC Infonet e-resources, search skills, developing materials for scientific presentations, journalism and news reporting and editing for press and media were handled by the experts and resource persons from universities and other lead organizations..

Sensitization cum Awareness programs were also conducted for the Post Graduate students from all the departments of the University to understand and assimilate the developments of ICTs in general and particularly on e-resources, learning materials, UGC Infonet e-resources, CD/DVD Databases, research communication, presentation skills, information exchange and access to Internet and web resources to promote and optimum use of e-resources and facilities in the VLRC&DL. Over 4000 students have undergone a Sensitization cum Awareness program in the library organized during March-August 2008.

3. CONCLUSION.

Building 21st century libraries the librarians must focus on the ability of librarians and libraries to not just adapt to change, but to prepare for it, facilitate it and shape it especially developing a Virtual Learning Resource Centre to encompass an Information One Stop Point for academics. Though sincere efforts are on, a long way to achieve excellence to build a strong knowledge society for national development in the context of IT enabled information rich society.

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Impact of Digital Library in Management Institute and Corporate Libraries

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Abstract: This paper explains the role of digital libraries and their impact in management institute and corporate libraries. Authors also conducted a survey of librarians, teachers and students in management institutes and corporate sectors. The trend is towards use of digital library resources rather than the traditional resources.

Keywords: Digitization, Virtual Library, Electronic library in the new millennium

1. INTRODUCTION

In the most basic Sense, the term "Digitization" refers to the conversion of materials that were originally created in another format into an electronic form. Digital conversion of library materials has advanced rapidly in recent years, prompting some casual observers to believe that everything of importance can be found on the world wide web in digital form. But instant access to all the world's wisdom is still more than a mouse click away. It is important to resist the urge to digitize everything in a library or archival collection and destroy the originals in a mad rush to save space or occupy a place on the cutting edge.

A digital library service environment"—that is, a networked online information space in which users can discover, locate, acquire access to and, increasingly, use information. Although access paths will vary depending on the resource in question, the digital library service environment makes no distinctions among information formats. Books, journals, paper-based archives, video, film, and sound recordings are as visible in the digital library service environment as are online catalogs, finding aids, abstracting and indexing services, e-journal and e-print services, digitized collections, geographic information systems, Internet resources, and other "electronic" holdings

Digitization is an excellent way of providing access to library material, but the technology, in its current state of development, is not adequate for archival preservation. Digitization has proven to be possible for nearly every format and medium presently held by Libraries, from maps to manuscripts, and moving images to musical recordings. The use of hardware and software for capturing an item and converting it into bits and bytes, matched by a quickly developing set of practices for describing and retrieving digital objects, is giving form to the talk of library without walls. But such a virtual library has a very real price. Mangers cultural institutions and those responsible for policy matters related to digitization often find themselves struggling not only to understand the new technologies but also and more importantly, to grasp the implications of those technologies and to understand what digitization of their collections means for their institution, its patrons, and public, and the public.

2. DEFINITION OF DIGITAL LIBRARIES

The working group of the U.S. government's information infrastructure technology and applications defined "The digital libraries as the systems, providing users with a coherent access to a very large, organized repository of information and knowledge.

Broadly defined , a digital Library is a collection of computer processible information or a repository for such information.

R.R. Larson. CSTR Electronic library project group. University of California. Berkeley. In 1994 has defined 'Digital Libraries as a global virtual library of thousands of networked electronic libraries.

The aim of a digital library may be to expedite the systematic development of digital resources collection ; that means to collect, store and organize information and knowledge in digital form.

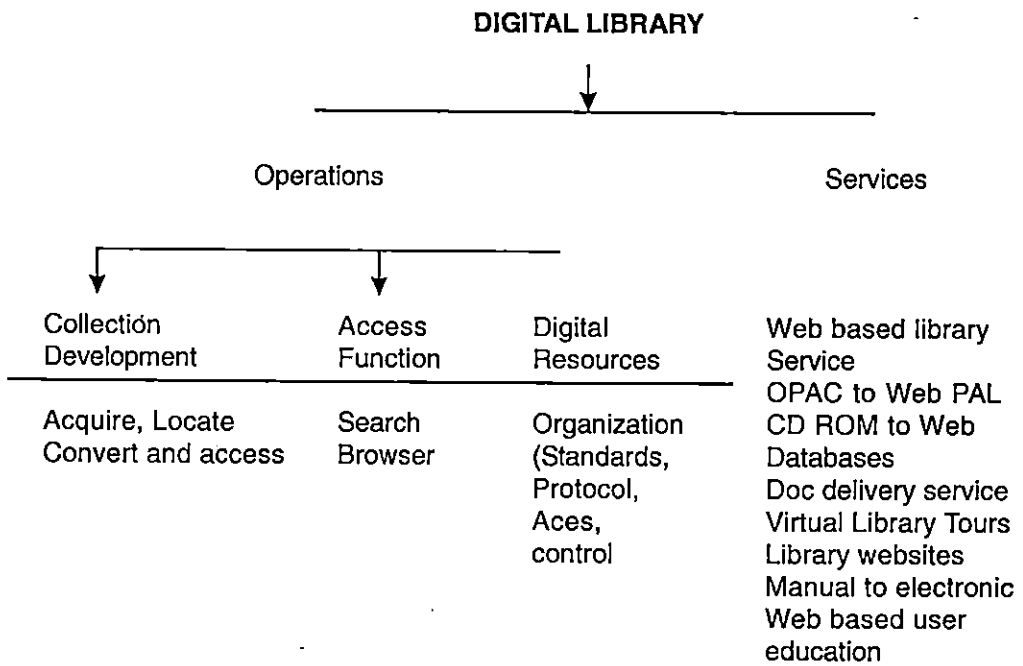


Fig. 1: Flow Chart of Digital Library

1. To capture, store, manipulate and distribute information
2. To introduce and provide new services
3. To avoid routine activities
4. To provide facility for networking and resource sharing
5. To digitize the documents for preservation and for space saving
6. To provide clear view of all information within a library in any format
7. To minimize cost involved in various library activities.

3. DIGITAL LIBRARIES AND ITS CHALLENGES

There are various tools available to use digital information system and they facilitate in accessing, searching, browsing, navigating, retrieving, indexing, storing, organizing and dissemination of digitized information. These tools include :-

3.1 On-line Public Access Catalogue (OPAC)

OPAC is fully integrated with the files containing the bibliographic, authority and circulation transaction information. Item location and circulation status accompany each bibliography display.

3.2 Compact Disc-Read Only Memory (CD-ROMs)

CD-ROMs in it information is permanently stored. The information from memory can only be read and it is also possible to write fresh information on it. A CD can store 650 megabytes of data that 's equal to data of around 550 floppies or 3,00,000 typed pages.

3.3 Microfilm

Microfilm is recognized worldwide as a practical and effective technique for the minimization of information technique that is, in terms of importance, capable of saving valuable space, protecting essential information and processing information. The later use is most important because it involves total systems concepts. Roll film for archival purposes has been supplemented by other microforms to meet every possible need.

4. MAJOR ISSUES/CHALLENGES IN CREATING DIGITAL LIBRARIES

Some of the more serious issues facing the development of digital libraries are:

4.1Technical Architecture

Technical architecture is the first issue that underlies any digital library system. Libraries need to enhance and upgrade current technical architecture to accommodate digital materials.

For e.g.

1. High speed local networks and fast connections to the internet relational databases that support a variety of digital formats full text search engines to index and provide access to resources, a variety of servers, such as web servers and FTP servers.
2. Relational Database that supports a variety of digital formats
3. Electronic document management system

One important thing to point out about technical architectures for digital libraries is that they won't be monolithic systems like the turn-key, single box OPAC's with which librarians are most familiar. Instead, they will be a collection of disparate systems and resources connected through a network, and integrated within one interface, most likely a Web interface or one of its descendants. For example, the resources supported by the architecture could include:

- bibliographic databases that point to both paper and digital materials
- indexes and finding tools
- collections of pointers to Internet resources
- directories
- primary materials in various digital formats
- photographs
- numerical data sets
- and electronic journals

4.2 Building Digital Collections

One of the most important issues in creating a digital library is building of the digital collection. One of the major issues is the degree to which libraries will digitize existing material and acquire original digital works. Who collects and digitizes which material could be based on factors such as collection

strength, unique collections, and the priorities of user groups, manageable portions of collection, technological resources and skills of the staff.

4.3 Digitization

Digitization is conversion of any fixed media, such as books, journals articles, photos, paintings, microfilm into electronic from either through scanning or re- keying. There are several approaches available at least theoretically.

1. Retrospective conversion of collections
2. High use materials
3. Highlight a diverse collection

4.4 Metadata

Metadata is important for digital libraries because it is the key to resources, discovery and use of any documents like a library catalogue. The Dublin Core is one of the prominent schemes. There is the problem of naming, identifiers and persistence. A global scheme of unique identifier is required. Three schemes proposed to get over the problems of persistent naming are PURLs, URNs and digital object identifiers:

- PURLs: are persistent URLs a scheme developed by OCLC separate document name from it's a location
- URN: Uniform Resource Name have been developed by Internet Engineering Task Force.
- DOI: Digital object Identifier developed by Association of American Publishers and Corporation for National Research Initiatives to provide a method by which digital object can be reliably identified and accessed.

4.5 Copyright

Copyright breaks down in the digital environment because the control of copied is lost. Digital objects are less fixed, easily copied, and remotely accessible by multiple users simultaneously. The problem for libraries is that unlike private businesses or publishers that own their information's, Libraries for the most part, simply caretakers of information. They don't own the copyright of the material they hold. It is unlikely that libraries will ever be able to freely digitize and provide access to the copyrighted materials in their collections.

4.6 Preservation

Preservation generally means keeping an object safe from harmful effects such as loss, damage, destruction and the like. The purpose of preservation is to ensure protection of information of enduring value for access by present and future generation. In recent decades, many libraries and archives have established format preservation programming for traditional materials. If we assume that libraries are able to build and acquire some types of digital collections, there remains a significant challenge inherent in preserving these collections Pre-digital libraries have had to worry about climate control and the deacidification of books, but the preservation of digital information will make these time consuming and costly problems look easy.

To preserve digital information, information on digital hardware and software configuration will require 'refreshing" or migration to more current system.

4.7 Process for Preservation

The preservation of library collection through IT is an easy task if you have all the required infrastructure on one platform. The preservation process can be divided into the following process:

4.7.1 Scanning Document And Making Image File

In this process the scanning of documents is an initial process. The documents should not be scanned below 300 dpi resolution. Basically, the resolution depends on the physical condition of the document. The scanned images are typically stored in file formats like JBG, TIFF etc. The final output is converted to a like format like PDF. PDF formats allow various security measures to be build in to prevent a user from edition, downloading, or even printing.

4.7.2 Scanning and preparing full text files

The process which is an important task is to rectify the errors and make text files error free with the help of optical character recognition (OCR) process. This process also involves proof reading and checking quality of text files. After completion of all the above process, the text is converted into the mark up language like XML, HTML etc. along with complete tagging which enables the database to be integrated with any web application.

5. DIGITAL LIBRARIES AND THEIR USES

1. Provide multiple access & access through the campus LAN.
2. Facility for downloading and printing.
3. Long distance and fastest communication.
4. Remedy for space problem.
5. World wide marketing is possible.
6. Easy source of information.
7. Provides user friendly interface
8. Supports publishing, annotation and integration of new Information
9. Provides an easy mechanism for resource sharing with other libraries.

6. LIBRARY CONSORTIA

Consortia is regarded as an effective strategy to increase the buying power of individual libraries over the short period of time and as an opportunity to maximize opportunities for cooperative collection building and for resource sharing over the long term. They offer the libraries the ability to give users the access they are coming to expect and demand to a much broader range of materials than any single library can possibly offer. Many library consortia have been formed on different lines across the planet both on national and international level. As far as the national consortia are concerned , they range from informal gatherings of library professionals for sharing information and promoting a united front to more formally organized operations. Some of the consortium active in India are :-

6.1 INDIA NATIONAL DIGITAL LIBRARY IN SCIENCE 7 TECHNOLOGY (INDEST)

The consortia based subscription to electronic resources for technical education system in India is the most ambitious initiative taken so far in the country by the Ministry of Human Resource development

under the chairmanship of Prof. N. Balakrishnan. The benefit of consortia based subscription to electronic resources is not confined to 38 Technological Institutions in the country but is also extended to all AICTE accredited and UGC Affiliated Institutions. It offers access to multiple electronic resources from different reputed publishers.

6.2 UGC-Infonet

It has been set up to promote the use of electronic databases and full test access to journals by the research and academic community in the country. The consortium covers all the disciplines viz. Pune Science, Social sciences, Management, and languages. Under this consortium, access to gateway portals is made available to the universities. These gateway portals provide access to more than 10,000 journals in various sub- field.

7. SOURCES OF DATA COLLECTIONS

The research consists of the application of both primary and secondary data. Primary data was collected by administering questionnaire. The secondary data was collected through websites and from various journals and magazines.

The questionnaire was administered to various Management Institute and Corporate Libraries. While it was sent about 50 questionnaires, only 45 questionnaires responded. The responses were obtained through the e-mail or directly through the concerned Librarian, Library Staff & different kind of the users i.e. Director, Teacher, Management students both Full time MBA Students and part-time students and corporate sector users had official handover the questionnaire received. The questionnaire was analysed through excel sheet. The analysis and findings are as follows.

7.1 THE ANALYSIS AND FINDINGS

7.1 According to the Librarian

- Is your institution equipped with digital library ? 82 percent said yes and 81 percent said no.
- From how many years you are using digital library ? 46 percent of the respondents said more than four years, 36 percent said 1-4 years and 18 percent not responded.
- Would like to work in traditional library, if offered more salary ? 80 percent of the respondents said No and 20 percent said Yes.
- Are you aware of online resources ? 91 percent said Yes and 9 percent not respondent.
- Do you think e-resources enhances the information of the users ? 73 percent said Yes, 18 percent said No and 9 percent not responded.
- If Yes, how frequently you use e-resources ? 64 percent said Daily, 18 percent said once in a week and 18 percent not nresponded.
- Do you think digital library is better than traditional library ? 95 percent said Yes and 5 percent said No.
- What is the future of digital library ? 100 percent said Paper Less Society.

7.2 According to the Users

Users are more important for use the Digital Library So, I think I have to take there view about the digital library.

- Are you aware of e-resources ? 97 percent said Yes and 3 percent said No.
- Is your institution equipped with digital library ? 76 percent said Yes and 24 percent said No.
- From how many years you are using digital library ? 68 percent of the respondents said more than four years, 26 percent said 1-4 years and 6 percent not responded.
- From where do you access e-resources ? 36 percent from Library, 32 percent from Home, 26 percent from All and 6 percent from Cyber Café.
- Are you aware of open access literature, free e-resources on the internet ? 65 percent said Yes, 32 percent No and 3 percent not responded.
- Which resources you find more interesting, enjoyable and satisfactory ? 47 percent said e-resources, 44 percent said Books and 9 percent said Both.
- Do you feel e-resources are comparatively more convenient for use than printed one ? 65 percent said e-resources, 29 percent said Books and 6 percent said Both.
- For gathering relevant information, on what resources you will depend ? 18 percent said Books, 18 percent said e-resources and 64 percent said Both.
- From the above options if you are told to choose any one, what you will prefer ? 50 percent said e-resources, 47 percent said Books and 3 percent not responded.
- Do you think e-resources enhance the information of the user ? 88 percent said Yes and 12 percent said No.
- If Yes, how frequently you use e-resources ? 65 percent said Daily, 29 percent said Once in Week and 6 percent not responded.
- Who motivates you to refer e-resources ? 44 percent said Friends, 35 percent said Teachers, and 21 percent said Librarian.
- Who helps (guide) you the most for referring e-resources ? 50 percent said Friends, 35 percent said Teachers and 15 percent said Librarian.
- Do you think e-resources and Books are the Opposite sides of the came coin ? 65 percent said Yes and 35 percent said No.

8. CONCLUSION

Digital library has become 'need of the hour'. The world is progressing with an immense speed. The ratio of knowledge generated is more as Compared to the time taken to print the knowledge. More and more institutions (public or private) are getting equipped with digital library. People are taking the advantage of E-Resources not only in the library but even at home and cyber café. When asked what they enjoy more? Books or E-Resources. The answer was very pleasing; the ratio of Books and E-resources was almost same.

As the life has become busy, most of the students, teachers and other users feel E-Resources are more convenient to use as compared to printed material. But when it comes to gathering relevant information every one unanimously showed their trust in both i.e. Books and E-Resources.

The data also shows healthy interaction and communication between the students, teachers and the librarian. Most of the users of E-Resources are motivated by their friends, teachers and the librarian.

Every one feels digital library is better option than traditional library, because with minimum efforts you can get maximum work done.

At the end I will like to say that, E-Resources and Books are the opposite sides of the same coin. Together they compliment each other and one without the other is incomplete.

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'JKflora': An Initiative for Knowledge Management in Web 2.0 Milieu

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Abstract: The paper introduces "JKflora"-a knowledge portal and gateway @DLIS (Kashmir University) sponsored by DSIR, New Delhi (www.jkflora.org.in) with an objective to deliberate on issues and challenges in research and scholarly knowledge development in Web 2.0 environment using basic concepts of social networking like blogs, wikis etc for enriching content (with suitable links and sources) by and for various stakeholders like researchers, entrepreneurs, agriculturists, students etc in an open access mode. It showcases participative and interactive mechanism which can be used as a test bed for developing various such initiatives by Library and Information Schools and centers to meet changing demands of different users in academic, research and business settings. It illustrates uploading useful information about herbs, identifying unknown images of herbs , shrubs and plants, etc besides making a provision for full text, references ,sources and annotated list of printed primary sources etc.The present paper besides bringing out issues and challenges, discusses lessons learnt and future modules of development in the unique and pioneering initiative completed in two years.

Keywords: Knowledge management, Content management, Web2.0, Flora Documentation

1. INTRODUCTION

The open content creation, thanks to developments in web technology, has paved collaborative and interactive ways for knowledge management and development on scholarly canvas and is one of the new focus of academics in the present century deriving sustenance from individuals and institutions monitored by diverse stakeholders in healthy competition amongst them and laying concrete foundation to these emerging tools of knowledge support for teaching and learning process and eventually evolving a powerful specie of different professions, with a vibrant e-ethics .The paper attempts to redefine the emerging trends and role of professionals (especially Subject librarians and specialists) in the current scenario by taking a case study of knowledge portal about plants particularly its services in web 2.0 environment.

2. 'JKFLORA'

JKflora is a research project undertaken by the Department of Library and Information Science (The University of Kashmir, srinagar, J&K) in collaboration with DSIR(Government of India, New Delhi) to document flora of all regions of J& K state

(Jammu, Kashmir and Ladakh) focusing especially on its potential (indigenous Knowledge) collected from primary and secondary sources. The data is available at (www.jkflora.org.in) through different access points, supported by many features useful to the scholar for enhancing his information and support in learning and research. The broad features are: Search, Advance Search, Browse, Book Search, Image gallery and Blogs/ wiki support, Add a plant, Identify a plant etc.The Figure 1 displays broad features of the portal.

3. WEB 2.0 LIKE FEATURES

3.1 Add a plant

Each plant record possesses information about Habitat, Chemical constituents, Local use, indigenous knowledge (Use) etc supported with full citations and sources.

The features of a plant are given in Fig. 2.

The library besides having search capability to search under various metadata elements like Botanical, vernacular and common names/ Family has developed a peculiar feature of adding a plant by a genuine user or stakeholder for helping to develop the library on continuous and collaborative basis, with proper controlling and regulatory mechanism. The initial process of adding a plant is given in Fig. 3.

3.2 Add an Image

This is part of the above feature and can be further improved in new version of the portal.

3.3 Add a Document

This feature helps to develop an online library about the flora of the region to help the scholars in a more useful way. However, it is limited to metadata and abstract (optional) for the time being and can be linked to e-repositories and other digital libraries/traditional libraries for access and assistance. Fig. 4 showcases the outcome of the feature.

3.4 Add a Reference

Each plant of the portal embeds sources, additional references and links to other web portals/ sites but we believe to have missed many important and relevant ones. The initiative endeavours to design a mechanism to develop interface to add and edit the page to make the information rich, useful and more relevant by constant process of adding references, additional sources and new or missing links.

3.5 Identify an Unidentified image

Plants abundant in nature have different botanical and vernacular names but it is not possible to identify them without adequate knowledge and/or team of experts. This portal helps to join hands of taxonomist and other experts to identify the plants and even rectify any mistake or enhance name variants of different linguistic and multicultural regions. This, of course, needs a revision and editing policy to avoid any mischief or gross error. (Fig. 5)

3.6 Add a blog

Blogging has become a live online process and helps in many ways. Our blogging initiative is aimed at to make process of notifying usefulness of plants known to globe for commercial and non commercial basis and invite attention of different stakeholders to enhance the process through review comments and developing a Blog or Blog like processes. It will quite useful to add to the knowledge, especially the indigenous one, to form a part of the portal at the end of the day. The blog feature developed is given in Figures 6 and 7.

4. LESSONS TO LEARN

4.1 Knowledge Creation

The initiative can serve as a test bed to develop many initiative by Knowledge and Information Centers (Library 2.0) in diverse areas so to act as stakeholders in emerging new canvas of e – learning and research in India. The other Developing Nations have enough potential to develop such individual and collaborative programmes. It is right time that special libraries and other rich and

developed libraries with support from their parent institutions should spell out the programmes of open content for knowledge generation, collaboration and development.

4.2 Content Management

This is the area where the professionals can play a key role for having better skills for knowledge capture, organization and presentation. However, they have to orient themselves to new information seeking behaviors and equip themselves with latest ICT techniques to meet the need of diverse population of the users. The multimedia revolution has thrown them new challenges as well as new opportunities to reach the public at large in a more soft and receptive manner.

4.3 Changing and New Role (LIS Centers and Managers)

The web2.0 and other advanced versions of the web and ICT tools are throwing open flexible and changing role to professionals to suit the ever increasing, diversified needs of the user in a sea of information disarray. They have to learn to manage new brand of libraries with new harvesting and presentation engines and provide more nascent services with new tools. Above all, they are set to develop new products day out and day in to compete with borderless and convergent professions to make niche for themselves and be the harbingers of the real managers of Knowledge and information Society sitting on the thorny portals of L&I centers.

4.4 Curriculum development

The Library Schools can't simply discuss to change the tags, for the name sake, but act on ground to work for Knowledge and information Studies in a meaningful direction to prepare professionals to meet all challenges and develop engineers capable of producing a new products for diverse institutions in both a public and private enterprises, societies and originations. The schools need to teach and conduct research on tools of creation, development, dissemination, organization of the knowledge products to suit diverse environment on the changing canvas of new ways learning, development and research and cant simply afford to embrace traditional tools. The philosophy may not change but conditions demand to meet new demands of a well equipped and relatively more aware user, not to rot himself or the potential user in unhygienic water. Thus, the Schools have to revamp their course contents in such away to develop competencies and skills of students and Trainers so to afford to be equal partners of Knowledge Society in both defining and developing the architecture of knowledge products in learning and teaching process.

5. ISSUES AND CHALLENGES

5.1 Economic

Economic challenge here implies that many under developed nation or regions still lack basic amenities of life and literacy where we have to stick to older tools and techniques but time will come soon when we have to look for their upliftment to bridge the divide. However, there is strong feeling and understanding that collaborative and innovative tools of web 2.0 in open environment (FOSS/ Open Scholarship) will throw cost effective and feasible ways and means to adopt these techniques to come out of the slumber of inequality. Hence, it is less of economic concern but of Political will and action in changing times.

5.2 Technical

Technical challenge seems less as ICT is developing at a very exponential speed but its penetration is not yet deep in developing countries especially in rural pockets and thus fruits will are not harvested in an equitable way. The digital divide need to reduced among different geographic pockets and even communities who couldn't keep track of it the track due to poor literacy , economic , social and political backwardness. This will otherwise act as a barrier in adopting usefulness of emerging tools for the developing and poor countries.

5.3 Academic

The tie up of the experts need to be forthcoming besides awareness drive through different means till users and experts develop the attitude for volunteering themselves to have useful inputs for the knowledge garnering, processing and packaging to result into its dissemination for the public good. However, initial steps need to be taken by research organizations, societies and NGOs to create a culture of developing open, voluntarily and Participative knowledge products for the overall well being. Some individuals and organizations have taken commendable initiative on the front but pace need to be accelerated.

5.4 Social

The social acceptance of the new knowledge products will be a biggest challenge in coming years due to our obsession with peer reviewed and accredited publications. We will either hesitate to cite such tools for a long time to come till we develop new versions of the peer review , more transparent and open to everyone, with less chances of plagiarism but may have more apparent chances of manipulation till Society evolves its own social, economic technical standards in a new scholarly environment.

6. FUTURE FOCUS

6.1 Shifting Canvas (Local to National/International)

The focus of every initiative can be to widen its horizon from a local to regional one till it gets international inputs and assume its creditability in academic and peer groups. The present initiative has potential to enhance its scope to regional one and converge into a national initiative. The other initiatives in process and future one can ultimately lead to international initiatives. With passage of time new technological opportunities will flow and may help to come nearer to each other for the integrated and coherent initiative for the flora and allied subjects and other new initiatives.

6.2 New Initiatives

In web 2.0 milieu, one can develop a wiki type initiaves to list all flora of the globe on voluntary basis and can name it as Floropedia/Herbipedia. This will be a new encyclopedia useful to different stake holders ranging from common man to business folk and also be helpful to students and scholars. The new library professional can play an active role in developing such initiatives for having better knowledge capturing and .organsing skills using both old(gold) and emerging(green) professional techniques.

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Journals in Transition from Paper to Electronic: Digitisation of Sociological Bulletin

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Abstract: The paper demonstrates the practical experience of digitisation of 55 volumes (1952-2006) of '*Sociological Bulletin*' journal published since 1952 by the Indian Sociological Society, New Delhi. The paper highlights the objectives of the project proposal, justification and anticipated impact, plan for the digitisation, process methodologies for digitisation, volume of work etc. The paper also describes various steps involved in the digitisation process, OCR software used and its advantages over other OCRs, search interface used, browsing and searching facilities, navigation facilities provided in the CD etc. Some of the past and present digitisation projects that have been carried out in the library are also mentioned in the paper.

Keywords: Digital Collection, Digitisation process, Greenstone Digital Library, GSDL, Sociological Bulletin, Indian Journal, Indian Sociological Society.

1. INTRODUCTION

The information contained in traditional print materials like books, journals, reports, published works, minutes of the important meetings, manuscripts, cannot be preserved forever for a number of reasons. As years pass by, the information contained in them gets faded out, the medium becomes brittle and finally becomes unusable. Unless we have alternatives arrangement for recapturing and reproducing it another format important will be lost forever. Fortunately, technological advances have provided us with suitable alternatives for preserving such valuable information

It s widely accepted truth that Information Technology has brought tremendous changes in the way of the life of the human being. Hence publication industry is not exception to it. In order to have wider access and long term preservation policy of scholarly human knowledge many of the professional organizations, publication houses are moving towards the electronic publication of the print resources.

The editorial Board of '*Sociological Bulletin*' (a journal published thrice in a year), published by Indian Sociological Society, New Delhi, has moved to such an innovative idea of digitizing the entire collection of the journal from 1952-2006 (Vol.1-55).

Sir Dorabji Tata Memorial Library, Tata Institute of Social Sciences, Mumbai, which is having the similar expertise and experience in handling such projects, has submitted the proposal for the same to Indian Sociological Society, New Delhi and the same has been approved and the MoU was signed by both the parties on 20th June, 2005.

2. TISS DIGITAL LIBRARY

2.1 About SDTM Library

Tata Institute of Social Sciences being the premier institute in the field of social sciences fulfils the mandate of producing knowledge and its dissemination in the field of social work and social development. Sir Dorabji Tata Memorial Library, located in the main campus, is a unique Knowledge Center, which offers essential and specialized information resources and services to meet the growing information needs by developing user-based resources, organizing information resources, providing human and technologically moderated access to information; and aiding and facilitating users to identify, locate, obtain and evaluate information.

In 2004, SDTM Library has setup Digital Library with the financial assistance from Tata Education Trust, Mumbai to provide seamless access to social science information to users in a networked environment by Creating Digital Content in the field of Social Sciences. Development of a Digital Library at the Sir Dorabji Tata Memorial Library is supposed to be the finest of digital resources on Social Sciences in the country as well as the South-Asian region. The establishment of this Digital Repository will also keep the library on par with major social science libraries in the world. The Digital Library facilities includes the state-or-the-art technologies like high-end desktop computers, digital camera, OCR software, scanners, high speed internet connectivity, access to e-resources etc. The library is carrying out many digitisation projects both in-house and outside projects. Following are some of the digitisation activities that are being carried out in the library.

Parsee Literature Digitisation: 150 years old Parsee literature of 10,000 pages has been digitized and made it available for the reference in CD-ROM format. The literature was in Gujarathi script and the language was Parsee. Entire 32 volumes have been accommodated in THREE CDs.

Indian Journal of Social Work (IJSW): One of the major achievements of the institute is uninterrupted publication of its refereed journal "*Indian Journal of Social Work*"(*IJSW*), since 1940. The *IJSW* is widely used by teachers, researchers, professionals in the field and students and has played a facilitative role in social work education across the country. Research study findings and theoretical conclusions of research are regularly published in this journal. The IJSW completed 68 years of publishing this year. Each volume is of approximately 700 pages and we had to digitize approx. 47,800 pages. The work is near completion.

Digitization of Theses and Dissertations: Apart from the general collections, the library also holds a good number of Dissertations and Theses submitted to TISS covering diverse subjects of social sciences. It is this rich valuable collection that has made the library unique in its own way. The main purpose of digitization here is to preserve, store and make available doctoral theses and dissertations. TISS Library has approximately 1500 MA Dissertations and around 250 doctoral theses.

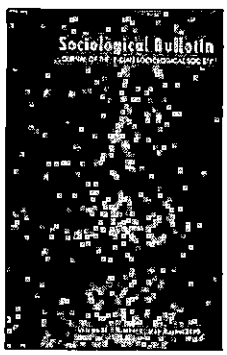
Project Reports /Monographs/Technical Reports brought out by Faculty: All the project reports, monographs, course material brought out by the faculty members can be digitized and hosted on web server for instant access from anywhere, anytime. We may be required to digitize approx. 100 monographs of each having 150 pages. We will be required to digitize 15,000 pages.

Books: The Publication Unit at TISS has published over a 100 books since 1940.All theses can be digitized to convert them into e-books. Each book is of an average 300 pages. We will be required to digitize 30,000 pages

Proceedings Volumes Digitization: Many national and international conferences /seminars/ workshops are being conducted by departments, research units and Library every year. Proceedings volumes of these conferences/seminars/workshops will be a good source of information. Hence the library has taken up the job of digitizing all the proceedings volumes of the institute and make available for access in the digital form.

3. DIGITISATION OF SOCIOLOGICAL BULLETIN: PROJECT PROPOSAL

3.1 About Sociological Bulletin



Sociological Bulletin is the official journal of the Indian Sociological Society, started in the year 1952. It is now published thrice a year: January-April, May-August, and September-December. It carries reports on research conducted in India and abroad by professional sociologists and anthropologists. Over the last five decades, the *Bulletin* has been advancing the frontiers of knowledge about Indian society, its social institutions and culture, and their structure and dynamics. It has been contributing to our understanding of other societies as well. The *Bulletin* meets the needs of higher education in India and provides for specialists and non-specialists alike. It also serves as an important source material for students and researchers.

3.2 Objective of the present proposal

The need for digitization of back volumes of Sociological Bulletin stems from the following Objectives:

- To expose to the world, the untapped and under utilized contents of Sociological Bulletin
- To facilitate in quick retrieval of the contents of Sociological Bulletin with user friendliness
- To permit other world scholars to use the resources for collaborative practical experimentation.

3.3 Justification and Anticipated Impact

All the volumes of the journal will be scanned and digitized. This digitization process is one time job. Presently the reach of *Sociological Bulletin* is limited to few who have access to its hard copy. Surely there are thousands of researchers and social scientists who will find this source useful. Once the contents of *Sociological Bulletin* are digitized, it can be accessed from all across the world.

- It achieves the preservation of important sources forever,
- Searching for information becomes easy, accurate and quick, and
- This digitized information can be updated easily.

Digitization of Sociological Bulletin will have significant impact because:

- It will provide a structured way to browse *Sociological Bulletin* contents
- *Sociological Bulletin* will have seamless access from across the world. Its reach will be far wider and faster.
- The contents of *Sociological Bulletin* can be preserved forever.

3.4 Plan for digitization

It is an established fact that 90% of the Social Science information in India is still on paper. And almost none of that rich content is in digital form. This has resulted in inadequate access to social

science information published in India and has been a serious national concern for years together to the social scientists and researchers.

3.5 Volume of Work

Sociological Bulletin has bas over 55 back volumes and the 56th is in the process. A total of 15,000 pages need to be digitized. The entire digitisation work was completed in 10 months.

3.6 Process Methodologies for Digitization

Scanning: All pages of Sociological Bulletin will be scanned by either of Flat Bed Scanners, Drum Scanners or Book Scanners. And the pages will be indexed with a unique number.

Data Entry: Wherever required, the data entry to be carried out to meet specific requirements.

Quality Control: Checking the documents being scanned and the maintaining strict quality check on the methodologies of digitization.

Conversion to PDF: Once the pages are scanned, it is further converted into PDF format. In the PDF format, various features listed in the Power Point Presentations can be added viz. Book Marks, Digital Signature, Self-sign In facility etc.

Document Management System: Developing a Document Management System for the easy access and retrieval of the contents.

Data Storage: Storing the Data onto the specified Database.

Writing on the CD ROM: Once the journal is digitized into the PDF Format, it is written on a CD ROM.

4. STAGES OF DIGITISATION

4.1 OCR- Optical Character Recognition

Optical character recognition (OCR) is the translation of optically scanned bitmaps of printed text characters into character codes, such as ASCII. An OCR system is an efficient way to help you turn printed/scanned documents, image or .PDF files into files that can be edited, searched and otherwise manipulated on a computer.

ABBYY FineReader 8.0 has been used in this project as OCR software as it is an easy-to-use program that recognizes texts in practically any font without any prior training. The program features high recognition accuracy and low sensitivity to print defects due to its incorporation of special recognition technology based on the principles of Integral, Purposeful and Adaptable (IPA) perception.

There are two main stages in the process of inputting a document for OCR:

1. **Scanning**. During the scanning stage, a scanner reads the image and transfers it into a computer. The acquired image is nothing more than a picture (a set of black, white and color dots that is not editable with a word processor).
2. **Recognition.** During the recognition stage, ABBYY FineReader analyzes the image file transmitted by the scanner (layout analysis) and recognizes each character. The layout analysis (selecting the recognition areas, tables, pictures, lines, and individual characters) and image reading processes are closely related. Page layout analysis is more accurate when the nature of the text is known to the application.

4.2 Steps involved in Abby Fine Reader 8.0

1. Scanning of the Print Documents using Flat bed scanner
2. Reading the scanned documents
3. Editing-Removing the unnecessary characters, redundant data
4. Check Spelling by using ABBYY fine reader
5. Proof Reading –checking the documents page by page and line by line for any missed character, and removal of redundant character
6. Save the final documents into 3 formats
   a. RTF(Rich Text Format)
   b. PDF (Portable Document Format)
   c. Batch Mode Files –as a source file
7. Taking the Back up of the Files in to CD-format

4.3 Browsing Sociological Bulletin CD

Browsing from Main Page: The Sociological Bulletin CD opens in browser (tested for all popular browsers compatibility) contains information about guidelines for the contributors, subscription/renewal, contact details, brief about the journal, etc. On the first page itself links have been provided to browse and search the journal, alphabetically arranged author index and title index (see Figure 1).

Browsing facility provides navigation from volume to volume, issue to issue (see Figure 2). Links to full text has been provided for all articles and book reviews from the contents page.

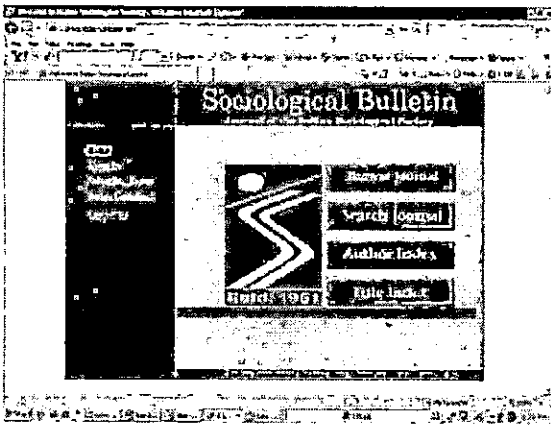


Figure 1: Main Page

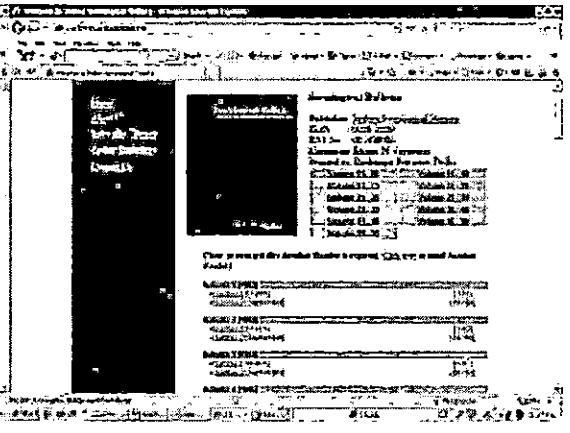


Figure 2: Browsing Page

Browsing from GSDL: One can also browse the entire content of the journal from GSDL application. Following are the TWO ways of browsing in GSDL:

- browse articles by Titles A-Z by clicking the Titles A-Z button (see Figure 3)
- browse articles by Authro A-Z by clicking the Author A-Z button (see Figure 4)

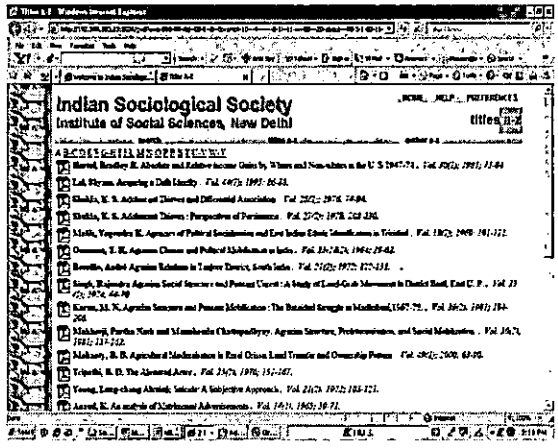


Figure 3: Browse by Title

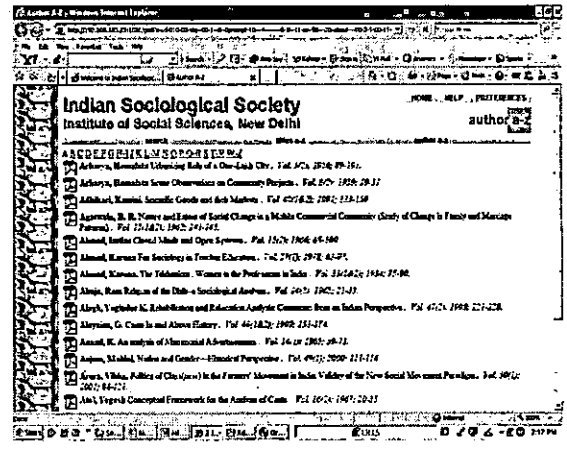
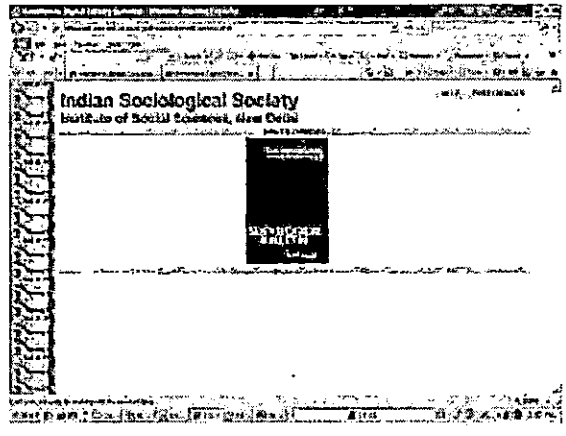


Figure 4: Browse by Author

4.4 Searching Sociological Bulletin CD



To search Sociological Bulletin journal on CD, a search interface has been provided using Greenstone Digital Library (GSDL) software ver. 2.72 and works only on Windows OS (Windows Vista/XP/ 2000/NT/98). Greenstone is a suite of software for building and distributing digital library collections. It provides a new way of organizing information and publishing it on the Internet or on CD-ROM.

How to Search the Journal:

- Go to 'My Computer' and open the CD by right clicking the 'CD Drive' and select 'Open'
- Double click the application 'Server' which opens Greenstone Digital Library server in a separate pop-up window
- Click 'Restart Library' button to start a default browser

  (Warning: Don't close 'Greenstone Digital Library version 2.72' pop-up window until you complete your search)
- Click 'Sociological Bulletin' icon to open 'Search Window'

A step-by-step instruction manual with screenshots has been provided in the CD on how to open Greenstone Digital Library **'Search Window'**.

There are 3 ways to search the journal collection (see Figure 5):

- Search the journal for a particular Word(s) in the text
- Search the journal by Author-wise
- Search the journal by Title-wise

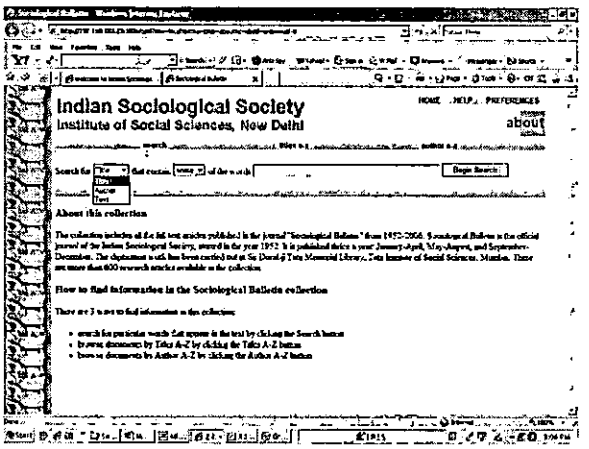


Figure 5: Search Window

5. CONCLUSION

New advances in the digital technology have made it possible to access digital information universal. This case study describes a very small digitisation project but the lessons learned can easily be expanded to larger scale projects. When digitizing content, issues of readability, preservation and digital asset management become the driving process.

A project page is being developed on official website of Indian Sociological Society (www.insoso.org) to create awareness in the profession about the digitisation and availability of *Sociological Bulletin* on CD.

The authors plan to continue to work on bringing more and more social sciences journals to the digital world and look forward to streamline the research value in the field of social science in India.

The CD of the *Sociological Bulletin* was officially launched at 33rd All India Sociological Conference held at Dept. of Sociology, Karnataka University, Dharwad (Karnataka State), 29-30 November to 1st December, 2007. There was a overwhelming response for the CD among the participants of the conference. More than 200 CDs were sold during the conference.

ACKNOWLEDGEMENT

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Knowledge for All: The Emerging Role of Digital Libraries in India

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Abstract: India is surging forward in all areas. In order to sustain this growth momentum it is very essential that the current and future generations are well read and have the ability to continuously learn. Books and journals are the basic tools for learning. The library is the place from where people can read and learn. However physical access to a library is not possible for all. It is not possible to set up a library in every village of India. But the library can be made reachable to all through Information and Communication Technology. Digital Libraries can help enable access to libraries to people who are physically located very far from the libraries. This paper will discuss the role of digital libraries in enabling knowledge for all in India. The paper will discuss the concept of digital libraries and will bring out , with examples from around the world , how digital libraries can be used to make knowledge accessible to all. The paper will also provide details of emerging trends in the digital library space.

1. INTRODUCTION

The role of the library in the spreading of knowledge is well known. The conventional library has been in existence for centuries. Right from the time of storage of manuscripts on clay tablets, papyrus and then paper the library has been the home of knowledge. Some of the world's largest and most well known libraries are institutions themselves. The Great Library of Alexandria was set up as early as around 300 BC. The 17th, 18th and 19th centuries saw several national libraries coming up in the world. However all these libraries were physical libraries which required the reader or searcher of knowledge to go physically to the library. This limitation itself cut off a large population of people who were unable to physically go to the library since they were located far away. The concept of a mobile library came up in the early part of the 20th century. The mobile library brought the library to the reader. In this case the library was a van fitted with books and journals which would travel to areas which were physically far away from the main library. Though an excellent concept it had its limitations in that it these libraries were available to the reader only at a specified pre-determined time. In addition the number of books which could be brought in the van was limited. Furthermore for a vast country like India it was physically impossible for a van to reach and cover the entire country.

The concept of extending the physical library to the remote areas of a country gained significant momentum with advances in information and communication technology. The concept of digital libraries is as old as the electronic computer itself. The digital libraries were basically information storage and retrieval mechanisms. However, the growth of the Internet and sophisticated search engines and browsers post 1990 resulted in more people connecting to each other and also connecting to various information sources. The next several years saw a large number of digital libraries coming into being. Most of the leading journals and magazines of the world became available on the Internet. Leading libraries of the world put up their catalogs online. Interactivity through the Web 2.0 is now increasingly being done by libraries. Therefore knowledge and access to knowledge became easier and widespread.

2. ISSUES WITH DIGITAL LIBRARIES

Advancements in technology have made it possible for a student studying in a remote school to be able to access some of the best libraries in the world. The digital library , though offering great potential to spread knowledge , is not easily accessible to all , especially those people living in remote areas. If the digital library is to be used to provide knowledge for all then it is important that the library be made accessible and the contents be in a language which the target audience can understand. Some of the major issues in enabling the spread of knowledge through digital libraries are:

1. Access to the Internet is a major issue especially in developing and emerging nations. In most developing and emerging nations, the Internet is available primarily to the urban population. The rural population and people living in remote areas are cut off from the Internet. Those who do have access do not have good bandwidth available to them with the result that they are unable to use the full capability of the digital library.
2. Cost of digital libraries is another issue. Many excellent digital libraries charge the user very high amounts of money to access these libraries. This itself cuts off a large population of people who cannot afford to pay for the usage of these digital libraries. .If access to knowledge is to be made available to all then it is important that it be also affordable. So open access to digital libraries is one possibility. A parallel can be drawn from the information technology industry. The open source concept in the information technology industry has made expensive software and solutions very affordable. Similarly open access to digital libraries will also make access to knowledge very affordable. The Open Access Initiative is an initiative by which people can have access to knowledge material through an open digital library. These materials for reading are free of cost. There are many such projects currently in the world. The Open Courseware Consortium is a consortium of several Universities in the world .Professors from these Universities voluntarily upload their course material free of cost and make it available to anyone in the world free of cost. The Massachusetts Institute of Technology is one of the pioneers in this movement. Nearly all the courses of MIT have now been put up on the web and are available to all free of cost.
3. There are also difficulties in the search mechanisms that exist in current digital libraries. The digital libraries are not intelligent enough to be able to give the reader exactly what he wants. If knowledge is to be made available to all then it is important that the digital library search mechanisms be made intelligent to be able to retrieve quickly the information that a reader wants. In other words the digital library should also have a system which can play at least a part of the role of the librarian. The librarian is able to suggest and advise the reader on issues which the reader is interested in. The digital libraries of today are unable to advise the reader. This is one of the drawbacks of the digital libraries of today.
4. As we move into an era where information technology becomes all pervasive and information appliances are used by an increasing number of non technologists, it is important that the digital library should be easy to use. If the design of the website of the digital library is made easy to use then it becomes an added incentive for people to access and read. However if the usability of the digital library is difficult then the usage of the library will be impacted and non technologists will not be enthused to use the digital library. In addition local language interfaces should be made available to the user who may not be able to read and write in English, which is the language used by most digital libraries today.

3. CONCLUSION

Digital libraries have opened up a very large window of opportunity to spread knowledge across a very wide population. In developed countries digital libraries are used heavily by a wide spectrum of people. In emerging countries like India the potential for the spreading of knowledge through digital libraries is huge. However issues such as internet access and bandwidth, local language interface and ease of use of the digital library have to be addressed. Emerging technologies such as the semantic web and the Web 2.0 will permit a high level of interactivity along with local language interfaces and translation. In addition access to the Internet through satellite will make the digital library available to remote and rural parts of India. There are already several digital libraries in India. The Digital Library of India, The Honeybee Digital Library, The Traditional Knowledge Digital Library are some examples of very innovative digital libraries in India. These libraries have been designed to address knowledge related issues specific to Indian conditions. However a lot more needs to be done to spread knowledge through digital libraries in India.

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Knowledge Resources: A Special Reference to Art Image Databases

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1. INTRODUCTION

A painting is a unique object. It is born in the mind of the artist and crafted into being by his/her own hands. Art is a manifestation of emotion, deeply felt and beautifully expressed. Art affects our innermost senses. It makes us happy, reduces strife in our minds and fills us with peace. Art inspires, elevates and motivates us, making us feel better about ourselves. As it has been doing from the early dawn of civilization, when the caveman painted his/her hunting exploits on the walls of his/her house and felt all the prouder for it. With the advancement technology, art images on the web represent one of the frontiers in terms of pools of knowledge: millions of historic art images served and more to come. Academic libraries, especially those connected to art galleries or art museums, often maintain subject guides to art and art history.

The development of networking technology, Open Archives Initiative and specialized metadata vocabularies and rules developed by research institutes i.e. Getty Research Institute (USA) etc., the web universe of digital art resources shows tremendous enhancement. Many countries struggle with copyright issues when it comes to displaying art reproductions on the Web. Academic institutions attempting to comply with the complexities of copyright law take a variety of approaches to the display of digitized art images, ranging from campus only or proxy server access by authorized faculty, staff and students to full public access. Some academic museums and galleries provide thumbnail catalogs for general public access.

2. SEARCH AND RETRIEVAL

The lack and inaccuracy of information describing for image content is poses a significant challenge to searchers and image database developers. Without detailed image content metadata, search options may be limited to the kinds of advanced search options we see on Google, Yahoo or AltaVista images: text in the file name, file size, files format and whether the image is color, grayscale or black and white. Fig. 1 depicts that, mode of web based image search and retrieval, for i.e. Google's Image Search FAQ indicates that the search engine places more weight on the image's context within a web page, especially textual information in the image hyperlink. Image search engines are two categories. General search engines such as Google, Yahoo and AltaVista index image file format and property data, that is, metadata about the image file itself, but not the image content directly. The content connections come from the language surrounding where the search engine found the image or content-in-context indexing. Specialized search engines attempt to analyze image content by applying various techniques such as edge detection, color, shape and texture comparisons and other basic values and properties. Most content based image search engines work on a search principle called Query by Example.

The user selects from an existing set of images and the search engine attempts to produce matches from its image collection.

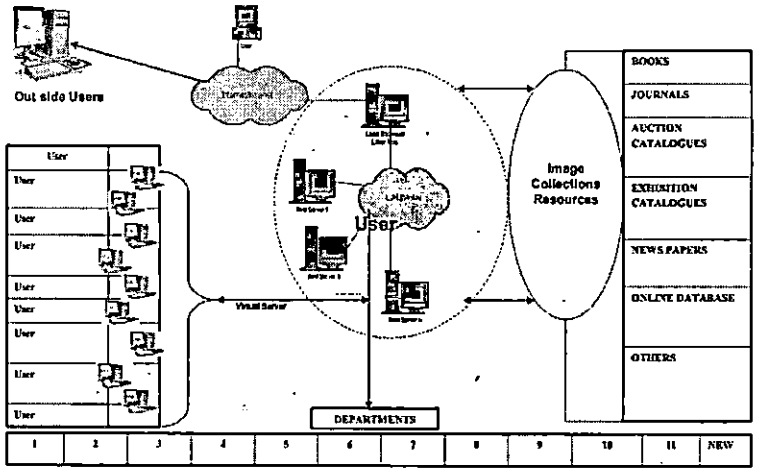


Fig.1: Mode of Web Based Image Search & Retrieval

Many of the specialized search engines depend on the same techniques used in identifying objects in other fields, e.g., satellite detection, fingerprint matching, etc.

3. OPEN SOURCE SOFTWARES

Following open source softwares are accommodating for development of image databases. viz.

- If you'd like to try content-based image retrieval and have the right computer components, **imgSeek** http://imgseek.sourceforge.net, an open source application, contains some of the functionality used in IBM's QBIC technology.
- The related **imgSeekNet** project http://imgseek.sourceforge.net, available in prototype form on client server architecture, hopes to create a distributed content based image search engine or peer to peer network.
- The **GIFT** software (GNU Image Finding Tool) [**http://www.gnu.org/software/gift/** or **http://savannah.gnu.org/projects/gift**] from the University of Geneva is another open source CBIR system based on the query by example model. These products appear to work best with representational photographic images, rather than fine art images. While not a content-based image retrieval tool and designed specifically for digital photographs,
- Eamonn Coleman's Windows based free **PixVue** image management software http://www.pixvue.com, deserves mention because of its support for JPEG and TIFF metadata, along with PixVue's integration into Windows Explorer.

4. QUALITY PRINT

Most sites display digitized art in the JPG format, all the other sites, even at the highest resolution, generally in the 600 x 400 pixel or mid-size range, do not reduce the colors to a noticeable level. A handful of sites are offer high resolution JPG and BMP images. Graphics software, such as Paint Shop Pro, Adobe Photoshop and even Windows XP Explorer will provide with technical information about the image. We can find lots of interesting and very technical explanations around the subject of color management, which includes topics such as pixel depth and image resolution, through a Google, Yahoo etc.

While most of the sites are free access to digitized images, this does not mean that we can download and use images for research. Many sites digitally watermark their images. When we see a watermark, we probably don't need to read the fine print on usage restrictions to realize that the institution or organization wishes to maintain control and probably licenses the image's use. Some sites go a step further and prevent downloading altogether through various techniques, including special client viewing software.

5. ROLE OF THE LIBRARY

Good art is everywhere and thousands of cultural and academic libraries around the world are busily digitizing more for a variety of purposes. While tend to associate among public, historic, fine art collections with museums and galleries, the libraries are an equally important caretaker and source for our artistic heritage, particularly when it comes to printed engravings and lithographs. With ongoing research into image retrieval, larger union catalogs of images and federated or distributed search databases, consortium of art and heritage libraries etc., we hope looking for good art will become less of a challenge and more of a pleasure in years to come. Despite the fascination of content based image retrieval, accurate, valid, standardized and detailed metadata is the key to the precision recall of online art images. The general image search engines such as Google images or large scale image databases such as ARTstor and others comes down to the depth and quality of the metadata. In large image databases, we can see that the ability to begin a query or to filter search results by specifying image content attributes. For example, show me only painting that contain a pink color object that resembles a flower, will narrow the possibilities down, but no amount of statistical inference and machine learning, without prior or concurrent human intervention in the process of database development, deriving subject headings, classification, search and retrieval processes, can distinguish professional painting of a pink flower from the masterpiece by Raja Ravi Varma and others.

Of course art and artistic images represent only a small subset of the overall problem when searching for online images. Still, we believe we are a long way from the kind of artificial intelligence required that would permit a machine to consistently and reliably identify. The remarkable achievements of researchers around the world in the field of computer vision, pattern recognition, machine learning and content-based image retrieval. However, all software designer, content creator and provider can contribute and help redefine the possible when it comes to searching for good art.

6. WEB BASED IMAGE RESOURCES

Some of the important universities, colleges, institutions, museums, galleries and auction houses are providing online access facility of images for research and development in the filed of art and allied subject viz.

URL	Description	Country
http://www.musee -online.org	Aiming to provide information about every museum in the world, the MuseumNetwork.com's Musée guide links to more than 37,000 museums. Like MuseumStuff.com, it has an Art & Design category, we can use the advanced search to find an art museum.	Australia
http://www.picture australia.org	PictureAustralia offers searches and hooks into over 1 million online images from fine art to historic photographs from nearly every major Australian cultural institution. Museums and galleries directly contribute descriptive records and digital images of their holdings to AMOL (Australian Museums and Galleries Online) Open Collections.	Australia
http://www.nga.gov.au	At the National Gallery of Australia, we can use the advanced search or detailed search interfaces to limit search results out of some 25,000 descriptions to those with an online image. We can also retrieve descriptions of works displayed within the gallery, a feature also offered by other museum and gallery databases. The gallery operates a second database for the Australian Prints and Printmaking Collection with around 35,000 images.	Australia
http://www.saskia.com	Saskia, Ltd., We can browse its catalog of over 27,000 images by textbook set, image sets, artists, museums, countries or periods.	Australian
http:// www.bump.fundp.ac.be	Bogaert-Damin, Universitaires Notre-Dame de la Paix, Belgium, is a succinct guide in French to some of the most important Web resources for art history.	Belgium
http:// www.virtualmuseum.ca	The Virtual Museum of Canada Image Gallery features an illustrated database to nearly 450,000 digital reproductions of cultural objects. We can keyword search or browse through predefined topics, as well as link to dozens of virtual exhibits with hundreds of online images. The Canadian Heritage Information Network (CHIN), an internationally renowned museum network maintains the VMC and it alone constitutes an important source of information on the digitization of visual arts collections in Canada.	Canada
http:// cybermuse.gallery.ca	The Cybermuse tool lets we can view more than 15,000 images of works from the permanent collection, along with interpretative and background resources. We can search the Library and Archives Canada Documentary Art collection of over 3,300 digitized, public domain images preserved in archival collections. We can search for digitized illustrations from printed publications and other kinds of pictorial content through Images Canada, a union database hosted by the Library and Archives Canada.	Canada
http:// www.artimage.orgl	A union catalog to three Quebec art museums is 6,785 described works from the Montreal Museum of Fine Arts, 3156 items from the Montreal Museum of Contemporary Art, with a few items dating back to the early 1900s and 4,786 pieces from the Quebec National Museum of Fine Arts. Not all descriptions, however, contain a digital image of the work.	Canada
http://artatlas.com	ArtAtlas the database of art gallery contact information's, nominally confines its entries to basic contact information, including a gallery Web site if it exists. We can search for a gallery by name, city, or artist.	European Countries
http://cgfa.sunsite.dk	Carol Gerten's Fine Art, A Virtual Art Museum contains images we can browse by artist name, nationality and time period. It also carries compiled biographical information for most, if not all, the artists.	European Countries
http:// www.euromuse.net	While Euromuse.net, the official network of European art and cultural history museums, focuses on exhibition activities, the resources page links to several databases with art history information.	European Countries
http:// www.abcgallery.com	Olga's Gallery is especially strong in online images of European and Russian artists. Several indexes locate galleries by artist name, artist country, artist by movement or school or a complete index to all persons. Background resources such as artist biographies and thematic indexes relating to the depiction of religious themes in art have provided.	European Countries
http://www.euroclio.net	The gateway to museums and history in Europe, for links to historical museums throughout the European Union.	European Countries
http://www.arthist.net	Other academic-related sites that will help us to find art image databases include ARTHIST, the H-NET Information Network for Art History	France

URL	Description	Country
http:// www.insecula.com	Insecula, offers keyword searches to museums, places, works or to artists. It has in-depth entries for individual artists and museums as well as linking to individual artworks.	France
http:// www.culture.gouv.fr	Database containing digitized cultural content supported by the French government's Ministry of Culture and Communication is through a handy, descriptive list, including digitized image counts.	France
http://www.culture.fr	Culture is partially available in English and Spanish. This portal covers both French and international museums with an online presence in its Museums section. Recherches section contains descriptive links to digitization of cultural heritage.	France
http://www.arts culture.education.fr	Arts Culture, a national, distributed educational network responsible for multimedia educational programming and curriculum resources, assembled an arts guide, named after the department, Arts Culture, which contains more than 15,000 records and a distributed, map-based interface to French cultural institutions.	France
http:// www.culture.gouv.fr	The French government hosts two important sources of digitized historical artwork: the illustrated Joconde Database: Catalog of the Museum Collections of France, a union catalog with over 45,400 thumbnails and downloadable mid-resolution JPGs of selected fine arts and decorative art objects, as well as other kinds of cultural objects, Network of Art Research Computer Image Systems in Europe Database, select Consultation link at bottom of page, which describes 16,000 works created between the 14th and 20th centuries by 2,000 different artists represented in 1,100 French and other museums, along with 31,000 images.	France
http://catalogue.inha.fr	The Institute National Histoire Art hosts a union catalog that covers the libraries of cultural and educational institutions such as museums and the Sorbonne's École nationale des chartes. This is an excellent tool, as is the National Library's union catalog for uncovering art history publications issued by museums and libraries.	France
http://cartelen.louvre.fr	A guide to Europe's most famous art museum, the Louvre's Atlas database describes about 36,000 works exhibited in the museum with nearly 19,000 illustrated. The English language search interface notes that database records appear in French, so enter "monna lisa" if we want to view Leonardo da Vinci's most famous portrait.	France
http:// www.photo.rmn.fr	A larger service, which also covers the National Museum Association's Photographic Agency we can search over 3,00,000 images of fine art and museum objects preserved in France's national and regional museums. The site offers a bilingual search interface in French and English. Most searching works with keywords, with only one controlled vocabulary.	France
http://gallica.bnf.fr	An important source for historical, illustrated works from around the world, the National Library of France's Gallica is huge and well-indexed digital collection and virtual exhibits. Gallica is especially strong in renderings and drawings of architectural works, as well as illustrated books.	France
http://mandragore.bnf.fr	The Department of Manuscripts features a database called Mandragore that contains over 18,000 digitized, illuminated manuscripts.	France
http://opaline.bnf.fr	The National Library also maintains separate catalogs to its special collections. According to a data summary page on, it has 18,594 digitized maps and plans and 13,379 online prints and photos.	France
http://www.bnf.fr	These special catalogs are best accessed via the Prints and photographs and Maps and plans. By using the BN-OPALE PLUS link.	France
http://www.bm-lyon.fr	The Bibliothèque Municipale de Lyon makes searching its collection of digitized historic art prints and engravings dating between the 16th and 19th centuries.Its controlled vocabulary lists explained the number of items associated with each term.	France
http:// liberfloridus.cines.fr	The description and digitization of illuminated medieval manuscripts preserved in France's academic institutions is the goal of liber Floridus. We can browse 63,000 images from 1,700 manuscripts.	France

URL	Description	Country
http://www.ibiblio.org	The WebMuseum is probably has fewer than 6,000 images, Though the site lacks a search engine, we can explore it by artistic theme, artist name, or art terminology. Many reproductions can be viewed as high-resolution images (around 1400 x 940 pixels) and come with biographical and interpretative essays.	France
http://www.akg-images.com	AKG-images Art and History Archive. A quick advanced search in the Medium field of Bridgeman for "watercolour" revealed 18,280 hits, with "painting" displaying 59,820 items, and "drawing" a mere 153. Most of the database records include an image. AKG, which serves only business clients, offers over 1,50,000 digital images on a variety of topics, not just historical art.	Germany
http://www.kultur portal-deutschland.de	Like Canada and France, the German government highlights its efforts to promote German arts and culture through its Kulturportal Deutschland	Germany
http:// www.historicum.net	Historicum.net pulls together various art history and history research resources, primarily in Europe. The emphasis, as far as art history archival sources go, is on photography as an art form and its role in documenting art collections. Look for these links in the Fachgebiete section, with a searchable archive back to its first issue in 2000, consists of reviews of new art history resources, including electronic resources such as CD-ROM image collections.	Germany
http:// www.kunstlinks.de	Kunstlinks contains one of the most extensive sets of annotated art history links.	Germany
http://www.kunstgeschichte-online.com http://www.portalkunstgeschichte.de	Kunstgeschichte-Online.com and Portal Kunstgeschichte offer a wide range of resources on art history in Germany and a few other European countries.	Germany
http:// www.kulturserver.de	Kulturserver: The Online-Community for Art and Culture brings together several state-level sites operating under the same domain name, along with partner projects that cover historic and contemporary art.	Germany
http://www.kunst-und-kultur.de	Kunst-und-kultur.de includes an illustrated database that covers international historic artists and architects.	Germany
http://www.ubka.uni-karlsruhe.de	For searches of art history publications held by several European institutions, nothing beats the Virtueller Katalog Kunstgeschichte, hosted by the Karlsruhe University Library and including catalogs from art library consortia such as IRIS in Florence, Italy.	Germany
http:// www.bildindex.de	One of the truly great European visual treasure boxes, the Bildindex part of Foto Marburg, hosts an astounding 1.6 million images, around half of them art images, and thousands in full color.	Germany
http://www.bildarchiv-bpk.de	Bildarchivs Preussischer Kulturbesitz, which holds 12 million, photos in various formats, with some subject matter including art.	Germany
http://www.bbf.dipf.de	A union database system for research and education within their academic system, that integrates data from several other public and private data sources such as Pictura Paedagogica Online.	Germany
http:// gallery.euroweb.hu	The Web Gallery of Art features over 12,000 online JPG format images of European art, accessed through an alphabetical artist index or a well-designed database.	Hungary
http://www.marvelart gallery.com	The marvel art gallery is all about Marvel was established in the year 2004. It took off by showcasing 33 top Indian contemporary artists. The gallery then carried on its journey with a mission to transform the Indian contemporary art. Marvel presently has over a thousand works of art of about 150 artists in its collection. Other than originals, the gallery has created an alternative market for limited edition serigraphs in this part of the world. More then 20 portfolios of some top artists including MF Husain, S H Raza, Jogen Chowdhary and Manjeet Bawa. Marvel has a good collection of many of their recent works.	India: Ahmedabad
http:// www.chandanaart foundation.org	Chandana Art Foundation is a registered and Public Charitable Trust devoted to the preservation and the promotion of artistic and cultural heritage of India and has been working towards cultivating an environment for creative, artistic, musical expression and cultural resources not only of India, but also that of the world.	India: Bangalore

URL	Description	Country
http://www.crimson artgallery.com/	Crimson - The Art Resource, is the oldest and most prestigious art gallery in Bangalore. Since its inception, in 1989, Crimson have endeavored to assist the Contemporary Art scene in its growth by promoting younger talent, associating with renowned artists and advising art collectors. Its resource offers works by over 60 artists thereby making it one of the most comprehensive sources of contemporary Indian art. It curates exhibitions thus providing artists with regular opportunities to showcase their talent. They have access to this substantial range of art, correct and timely information and expert advice. Crimson gallery is truly a rich resource for Indian Contemporary Art	India: Bangalore
www.masters-gallery.com	Masters is an international company, headquartered at New York. In India, it is based at Bangalore, they have gallery, for over 22 years they have satisfied thousands of customers providing different art works.	India: Bangalore
www.renaissance gallerie.comIn	In Renaissance Gallery one can easily find Indian Art, Online Art, Indian Fine Art, Realistic Art of India and Indian Paintings Online, opened its doors in 1993 to usher in a new order of art and culture. Renaissance Gallery an Art Gallery of Bangalore has built its foundations on the promotion of artists and the inculcation of art appreciation among its populous. It has exhibits paintings and sculptures of artists and ensured that each exhibition opening is flavoured with a culturally artistic twist. It is now a landmark of Indian Art, continues to embody the artistic glamour of New World.	India: Bangalore
www.mahuagallery.com	Mahua Gallery offers art lovers an opportunity to view and purchase contemporary Indian art from across India. The gallery's wide selection of Indian paintings, prints, sculptures and folk art provide a glimpse into the inspirations of leading and upcoming Indian artists.	India: Bangalore
http:// www.artworldindia.com	Artworld was established in 1997 as a second generation gallery geared to meet the challenges of promoting Indian Art abroad. Artworld has held path breaking exhibitions in several countries. The gallery deals with established artists of the country as well as promotes upcoming young talent.	India: Chennai
http:// www.anantart.com	**Anant Art Gallery** represents and promotes Indian contemporary art with a commitment to exploring artistic and cultural values through innovative and meaningful exhibitions. In its vibrant art space in the heart of New Delhi they have brought to the art viewing community, a variety of art exhibitions in diverse media which have been appreciated for their differing themes and the sheer power of visual expression. The Gallery's exhibition catalogues are an important source of documentation of Indian art. It is also promoting young talented artists whose work is of good quality and yet affordable currently. Anant is as much a gallery for young emergent artists as for celebrated artists recognized nationally and internationally.	India: Delhi
http://ngmaindia.gov.in	The Museum of Modern Art was felt for the first time in an Art Conference held in Calcutta in the year 1949. As a result the National Gallery of Modern Art was inaugurated on March 29, 1954, at Jaipur House, near India Gate, New Delhi. The Gallery is the premier institution of its kind in India. It is run and administered as a subordinate office to the Department of Culture, Government of India. The NGMA has two branches one at Mumbai and the other is being opened at Bangalore. The gallery is a repository of the cultural ethos of the country and showcases the changing art forms through the passage of the last hundred and fifty years starting from about 1857 in the field of Visual and Plastic arts.	India: Delhi
www.delhiartgallery.com	Delhi Art Gallery, founded in 1993, made a modest start by showcasing works of a few young and upcoming artists. It's focus is on discovery of the talented but obscured artists who have been eclipsed by the limited perception of the way art was bought and sold till a few years from now. Delhi Art Gallery has an ongoing commitment towards creating a greater awareness of Indian art. The gallery at the moment has an in house research and documentation cell. Art Gallery is also into publishing its own books, both monographic on individual artists as well as Manifestations that offers a sampling of the sumptuous collection.	India: Delhi

URL	Description	Country
www.galleryespace.com	Gallery Espace was established in New Delhi in 1989 with an exhibition of autobiographical works of M.F. Husain. The Gallery's name became synonymous with representing artists. Espace is dedicated to its constant endeavour of reaching out to un-chartered territories, including also its most recent participation in International art fairs, with the aim of giving a much well deserved and widespread visibility to its artists. The gallery hopes to carry forward its practice of sustaining a dialogue with the viewers at the level of artistic perception and aesthetic debate while also simplifying the process of buying art and bridging the gap between the art world and the art market.	India: Delhi
www.gallery threshold.com	Gallery Threshold was established in 1997, with a well defined role for itself to act as a catalyst in initiating contemporary art related activities and starting a dialogue between the artist and the viewer. Threshold is committed to bring concurrent Indian Art to pivotal attention, coupled with penetrating insight for picking up some of the best names in the art circuit and curating a number of exhibitions. The gallery regularly hosts Artists Retreats worldwide along with workshops in Painting, Printmaking and Sculpture. Threshold has represented artists at International Art Fairs. The Gallery has been at the forefront in Promoting Contemporary Indian Sculpture. Threshold has a defined role to focus national and international attention on the vibrancy, sensitivity, richness and depth of Indian.	India: Delhi
www.paletteart gallery.com	Palette Art Gallery established in the year 2001. Palette Art Gallery situated in the heart of New Delhi, prides itself with the most unique collection of Contemporary Art in India. The Online Art Gallery brings to details of all exhibitions held in the past and the forthcoming show.	India: Delhi
www.vadehraart.com	Vadehra Art Gallery has been actively promoting contemporary Indian art through exhibitions, retrospectives and publications. Set up in 1987, it is one of the premier art galleries in India. In addition to advancing art in the private arena, it has dedicated to making art available to the community at large. In a country like India, where a vibrant and comprehensive art museum culture is as yet not available, it was paved the way for an active collaboration of the private and public sector. They were the first to work in partnership with the National Gallery of Modern Art to organize retrospectives of renowned artists. It was published twelve books so far that range from monographs on artists, to books on art making techniques, to picture books and finally a comprehensive art directory and all these publications have provided the art world with wonderful insights on Indian art.	India: Delhi
www.shrishtiart.com	Shirshti Art Gallery is having great works of original Indian contemporary artists. It was conducted more than 85 exhibitions of leading artists nationwide. Shrishti Art Gallery that has taken shape in Hyderabad and such times presents a range of original paintings and sculptures, conceived and created by best contemporary Indian art.	India: Hyderabad
www.cimaartindia.com	The Centre of International Modern Art opened in 1993. It was designed under the guidance of renowned art galleries and museums in London and New York. CIMA has established itself as a premier art center of India. It has curated and organized over 100 exhibitions that have won critical and popular acclaim in India and abroad and has also been responsible for catalyzing creative excellence. The CIMA has implemented several projects in association with international museums, funding agencies and educational institutions. The Centre has state-of-the-art gallery, a comprehensive data base and evaluation and publication facilities. CIMA has, thereby, focused attention on the finest talents of the contemporary art scene.	India: Kolkata
http:// www.chitrakootart gallery.com	The Chitrakoot Art Gallery, established in 1984, the gallery served as an outlet for contemporary artists in Bengal where they could display their work in the right environment. It was provided the much needed platform for the budding artists, promoting them in which ever way possible, helping them get a foothold in the ubiquitous world of Indian art.	India: Kolkata
http:// www.emamichisel.com/	**Emami Chisel Art** idealized as a full-fledged art and its value enhancement sector has made its mark in the market. **ECA** auction house with sufficient infrastructural facilities, deliver fair value to both collectors and artists through its meticulous study and evaluation of aesthetic and	India: Kolkata

URL	Description	Country
	market trends in art. The **ECA** collection only includes authenticated paintings, sculptures, prints and drawings sourced from the artists themselves, or else from reputed art galleries and private collectors. Apart from its very own auction premises the **ECA** infrastructure includes gallery, library, archive, bookshop, publication wing and an annex for showcasing art from various regions, making it a veritable knowledge center for almost every aspect of Indian modern and contemporary Art.	
www.bombay artgallery.com	Bombay Art Gallery was established in 2003 with the vision of promoting 'classical-contemporary' Indian art and a unique group of young emerging artists. Since its founding, Bombay Art Gallery has curated a series of shows that highlight the overtly contemporary yet classically-inspired work of talented artists in the mediums of painting, drawing, sculpture, photography and installation. The innovative thought processes and dynamic work of these artists enrich India's contemporary art scene on the local, national and international levels. Bombay Art Gallery is pleased to support and promote these artists at its gallery space in Mumbai and further field. The shows are widely attended by Mumbai's vibrant community of collectors, artists, journalists, fellow galleries and international visitors. Artists working with Bombay Art Gallery find that the Gallery is committed to helping them develop their art careers, through ongoing mentorship and discussion, future sponsorship at residencies and art camps and introduction at the national and international levels. It also participates in international art fairs with the objective of bringing the work of the artists it represents to an international clientele and expanding global awareness of contemporary Indian art.	India: Mumbai
www.galeriems.com	Galerie Mirchandani + Steinruecke was established in Mumbai in 2006. It had dealt in Indian contemporary art since the mid-1980s. The gallery represents a portfolio of young and mid-career artists, who bring a highly individualized sensibility to Indian contemporary art. The artists work in diverse media including painting, photography and video, charcoal drawing.	India: Mumbai
www.gallery chemould.com	Gallery Chemould established in 1963, leading contemporary art gallery based in Mumbai. The Gallery has the distinction of having exhibited and represented the works of major artists, emerging from the first waves of India's modernist and contemporary art movements.	India: Mumbai
www.guildindia.com	The Guild Art Gallery supports and nurtures younger generation artists whose works reflect intellectual riguor as well as serious thought processes. The gallery helps in their quest to discover new initiatives by providing them a platform for investigational as well as project based works. The gallery now represents a number of recognized artists in contemporary art scene. The Guild has had a dynamic genre of shows encompassing multimedia art, photography, conceptual art, sculptures, graphics and paintings. The Guild's endeavour is to broaden the scope of showing the works of the artists they represent at various avenues including exhibitions, collaborations and fairs. There will be continued efforts on the part of the gallery to find and cultivate dynamic, young contemporary artists who have the potential to contribute substantially to the understanding of human experience given the right environment and direction.	India: Mumbai
www.sakshigallery.com	Sakshi Gallery, Mumbai gallery has reference books on art, within a comfortable browsing space.	India: Mumbai
www.samsaraart.com	Samsara Art is a strong bridge between talented artists and connoisseurs of art. The overwhelming global interest in Indian art and the works of Indian artists who represent India at its wondrous best, led to the establishment of Samsara art. A committed company for art lovers, by art lovers, of art lovers. Samsara art believes that contemporary Indian Art of International quality simply must be within the reach of one and all. This portal is a reflection of Samsara art's aspiration to showcase the best of Indian art to the national and global market.	India: Mumbai
http://sanstache-artgallery.com	SansTache Art Gallery showcases works of emerging, established and student artists. It seeks to internationally promote contemporary Indian art & strives to deliver this by creating opportunities for the artists. The Gallery's vision is to promote excellence and innovation in all aspects of	India: Mumbai

URL	Description	Country
	its work and explore the unique contribution that the arts can make to our understanding of contemporary life & bring artists and public together to learn in a demanding and creative environment.	
http:// www.saffronart.com	Saffronart was founded in 2000 on the strength of a private passion. One of the most comprehensive and definitive sources of modern and contemporary Indian art, it provides a platform which enables access to purchase, view and become involved in the development of Indian art globally. Today the most widely utilized pricing resource for Indian art, has set global benchmarks for online art auctions and has recently been included in a case study at the Harvard Business School. With auctions, fixed price website sales, access to associated galleries exhibition programs and technology enabled services for clients, all connected through an unparalleled online presence. It has effectively made reach to Indian contemporary art simple and instantaneous. Also involved with various institutions, organizations and publications, Saffronart is driven by an endeavor to provide the most accurate and timely information on Indian artists, events and trends. Saffronart gallery spaces in Mumbai and New York and its offices in London, supported by an informative and interactive website, provide access to a substantial range of art, information and advice. The website, has extended the company's traveling exhibits and art activities beyond their physical locations by providing convenient access to an extensive range of art for sale, along with detailed information on artists, interviews, exhibitions, events and more. The online catalogue has several thousand artworks from established and emerging artists, each delivered virtually anywhere in the world.	India: Mumbai
http:www.osians.com	Osian's Connoisseurs of Art was established in 2000 as a pioneering arts institution in India, Osian's is at the heart of Mr.Neville Tuli's vision of creating a new infrastructure and model for the Indian arts and culture, whereby a merit-conscious and financially self-sufficient infrastructure is put in place, independent of traditional patronage systems but grounded in its own ability to be a part of India's developmental framework. With its Auction House, The Osian's Art Fund & Art Advisory Services, The Centre for Archiving, Research & Development (CARD), The Literary Agency, Publishing & Design House, The Osianama (Museum–cum–Archive at the erstwhile Minerva Cinema), the Film House (including the Osian's-Cinefan Film Festival of Asian & Arab Cinema), Osian's has established itself at the highest international standards as a unique cultural institution. The Osian's Auction House is generating the finance to support and subsidize the Archive and Film House which is intensively occupied with documenting, preserving and disseminating the Indian and Asian artistic and cinematic heritage while creating knowledge bases for the study of these subjects. The Osian's Archive spanning five major areas is collectively the world's most comprehensive textual and visual Archive focusing on C18-20th Engravings, Lithography & Maps on India, C19th British-India photography, Modern and Contemporary Indian Art, the popular arts [including Advertising, Toys, Puppets, Playing Cards, Political Propaganda, Crafts] and the publicity material and memorabilia of World Cinema. Recently the Collection has taken major strides into building a significant presence in the art of the Indian miniature and the Nepali & Tibetan Thangka. Further, eclectic tangents are being taken into areas such as Japanese Samurai Armour and Dolls (Ningyo) of the C18-19th century, African Tribal masks, Polish Film Posters, among many other foci of the Osian's Archive & Library Collection. With Osian's acquisition of Cinefan, the Asian Film Festival and Cinemaya, the Asian Film Journal, the cinematic infrastructural base has widened significantly, complementing their vast archives. It is an intensive growth in this area of work as Osian's moves into building The Osianama is a unique integrated Arts, Cinema Resource and entertainment Centre-cum-Museum. The institutional steps required for Osian's to enter the arena of film financing and production are also moving forward rapidly. Osian's launched India's first Literary Agency in June 2007 as well as announced the creation of a Publishing & Design House, focusing on the Fine Arts, Architectural Heritage, Cinema and Popular Cultures, with the Agency focusing on Fiction with a focus on poetry, philosophy and high quality literature. All these developments are well on course to making Osian's the world's first arts and cultural institution.	India: Mumbai

URL	Description	Country
www.russian-centermumbai.org	Art gallery of the centre constantly hots feasts for the eyes of the art lover, though the display of the artistic masterpieces of the country.	India: Mumbai
Jehangir Art Gallery	The gallery art resource was based on the premises of promoting the fine arts in India and abroad. Keeping this in perspective, it wish to develop a healthy interest among fellow citizens about the Arts in India. The intention is to make foreign cultures aware that contemporary Indian art is a historical process that needs to be evaluated not in a chronological configuration but as germination. The gallery exhibits the affordable works of young and up coming artists.	India: Mumbai
NGMA	National Gallery of Modern Art (NGMA) of Mumbai is an institution, managed by the Ministry of Tourism and Culture, a venture of Indian Government. NGMA displays the Modern Contemporary Art of India as well as the other countries of the world; the gallery was opened to the public in 1996. It displays paintings of various renowned artists of India.	India: Mumbai
www.nehru-centre.org	The Nehru Centre Art Gallery is dedicated to the promotion of young talent and provides a platform for them to exhibit their work along with that of eminent artists.	India: Mumbai
http://www.ocaiw.com	Orazio Centaro's Art Images on the Web in 1997. The Painters index lists 1,027 artists from medieval times to the present. For each artist with their own page, it provides links to "Works from 'Virtual Galleries,'" as well as links to background resources on the artists.	Italy
http:// www.mudrumland.com	Museumland offers over 15,000 links from 142 countries through English and Italian interfaces.	Italy
http:// www.museionline.it	In addition to the many individual Italian city portals for locating cultural institutions, in Italian and some English-identifies Italian art museum sites through three different approaches, including a clickable map and individual photographers who specialized in this kind of work, for example, photos of artwork within its collection of over 60,000 online images.	Italy
http:// www.sbas.firenze.it	Florence, Venice and Rome provide some of the best on-site, historic, visual art in Italy. In Florence, the Superintendence of Fine Arts maintains a union catalog in Italian, to works of art in some of the public museums and archives under its jurisdiction.	Italy
http:// www.uffizi.firenze.it	Digital Archive through Direct Digital Imaging, deliver high-resolution images of the paintings via the Internet. It briefly describes the contents of each room in the Galeria degli Uffizi, with online images of around 500 works. The artist index includes links to biographical information.	Italy
http:// www.italnet.nd.edu	Online Inventory Catalogue of the Ambrosiana Drawings a visual database of around 12,000 images. Descriptions for 7,785 drawings are currently available for online searching.	Italy
http:// www.ibc.regione.emilia-romagna.it	This site contains 1,30,000 bibliographic records as well as 17,000 digital images. The IBC also maintains a database on the region's museums more than 400 and other cultural institutions.	Italy
http:// www.asrm.archivi.beniculturali.it	The State Archive of Rome's includes some medieval illuminated manuscripts, along with exquisite digital renditions of old land maps depicting the growth of Rome.	Italy
http:// www.museodiroma.comune.roma.it	The Museo di Roma offers a database with illustrated records. We can search by various media preserved here and order the searches by creator name or by time period.	Italy
http://www.sapere.it	An online encyclopedia hosted under the name Sapere.it includes a series of articles on art also called Enciclopedia dell'Arte. Through the advance search screen, specifying a search of only the thematic channel on art. There are about 17,906 artist biographies; Articles are indexed by artistic period and style, location, and technique or medium. The depth of each article varies.The Pittura section covers the visual arts.	Italy
http:// www.carabinieri.it	The state police offer a database of stolen works of art on its site, Arma dei Carabinieri, called the Opere d'Arte rubate; it includes over 7,000 graphic works of art from historic to modern times.	Italy
http://www.vangogh gallery.com	The Vincent van Gogh Gallery, endorsed by the van Gogh Museum, by Canadian David Brooks.	Netherlands

URL	Description	Country
http://www.codart.nl	CODART: Dutch and Flemish Art in Museums and Delineavit et Sculpsit: The Internet Site for Dutch & Flemish Old Master Prints and Drawings offer complementary lists to museums around the world, along with various kinds of Web resources. Both sites are authoritative, created and edited by art curators and scholars.	Netherlands
http://www.kb.nl	National Library of the Netherlands contains classified Web resources selected by the national library and Dutch university libraries. We can search by the Dutch Basic Classification system, Art Forms sections for online art images and resources. All resource descriptions are in English.	Netherlands
http://memory.loc.gov	The Memory of the Netherlands contains images and texts from the often hidden collections of Dutch cultural institutions.	Netherlands
http://rijksmuseum.nl	One of the principal historical art museums of the world, Amsterdam's Rijksmuseum has developed in-depth views of 1250 Major Exhibits. You can begin from one of four interlinked types of searches artist, catalog, encyclopedia and theme. We can download any of the high-resolution images. The collections database, which describes over 5,000 objects, many of them illustrated, exists only on the Dutch version of the site.	Netherlands
http://www.rkd.nl	Netherlands Institute for Art History, RKDimages database describes around 60,000 Dutch and Flemish artworks with at least one digitized image per record. The artworks range in time from the 14th through the 19th centuries.	Netherlands
http://www.atlasmutual heritage.nl	The Atlas of Mutual Heritage a collaboration between three national institutions, documents historic Dutch colonies United East Indian Company and West Indian Company, primarily through pictorial materials such as photographs, maps, paintings, prints, etc.	Netherlands
http://www.gemeen tearchief.denhaag.nl	The Municipal Archives of the Hague offers a digital collection of black-and-white and color pictorial materials, including art sketches. Over 1,000 digitized collection dating before 1999. The site also boasts an impressive collection of digitized maps at a variety of resolutions.	Netherlands
http:// www.zeroland.co.nz	Zeroland, the Arts on the Web, founded in 2000 by Adrian Hart in New Zealand, provides useful leads to European sites.	Newzeland
http://www.hermitage museum.org	The State Hermitage Museum finds artwork by selecting colors from a palette or by sketching shapes on a canvas, refines existing search results by requesting all artwork with comparable visual attributes. Nearly 5,876 digitized paintings, drawings and prints, including mosaics and stained glass objects.	Russia
http://hipatia.uab.es	The map-based graphic index is a great touch in Ramon Soler's well-organized, Spanish-language international guide, Recursos a internet d'art i arquitectura (Art and Architecture Internet Resources) hosted by the Universitat Autònoma de Barcelona.	Spain
http:// www.artehistoria.com	ArteHistoria offers various modes of access to Spain's art, culture and world history, including 6,300 not all of which represent historic art and some of which pertain to non-Spanish artists. We can view a complete image list by title. The core art history contents appear with sections on artists, their work, museums and galleries, styles and schools of art, materials and techniques.	Spain
http://www.bne.es	A Web version of Guide to Public Collections of Drawings and Engravings in Spain, which describes the contents of almost 350 public institutions.	Spain
http:// www.museothyssen.org	In Museo Thyssen Bornemisza, we can also search and view over 800 works from the permanent collections.	Spain
http://aisa-bcn.com	Spanish Archivo Iconográfico online search and 2,25,000 images are available.	Spain
http:// www.khist.unizh.ch	The Kunstgeschichte: Institute & Verbände Weltweit Art History: Institutes and Associations Around the World.	Switzerland
http://agora.ub.uu.se	Uppsala University Library's Agora: A Gateway to Online Resources in the Arts and Humanities targets the Swedish academic community and volunteer editors from various institutions review link submissions. Most of the 2,000+ resources (not all relating to art) are publicly available. Although the site interface is bilingual (English and Swedish), many of the resource descriptions are in Swedish or other non-English languages	Switzerland

URL	Description	Country
http://www.berger foundation.ch	World Art Treasures contains selected digitized images documenting historic architecture and art objects.	Switzerland
http://jeffer son.village.virginia.edu	The Rossetti Archive: The Complete Writings and Pictures of Dante Gabriel Rossetti: A Hypermedia Research Archive documents the most famous member of the Pre-Raphaelite Brotherhood.	U.K.
http:// www.blakearchive.org	The William Blake Archive, which includes thousands of this poet and artist's images, was awarded the 2003 MLA Prize for a Distinguished Scholarly Edition, the first ever for a Web site.	U.K.
http:// www.victorianweb.org/	The Victorian Web's Visual Arts section gave an excellent sense of what exists covering, The Arts in Victorian Britain for the two-thirds of the 19th century when Queen Victoria ruled.	U.K.
http:// www.artchive.com	The Artchive of historic and contemporary art, like many personal sites, appeals for funds to keep it open. Interlinked components consist of the Artchive itself, a Yahoo!-style subject directly accompanied by an alphabetic index that functions as a site map, a series of virtual exhibits and illustrated essay reviews a series of Galleries also functioning as virtual exhibits, and a selection of original and excerpted art criticism essays.	U.K.
http://www.the-athenaeum.org	The Athenaeum, devoted to the Pre-Raphaelites, contains over 18,000 online images contributed by users.	U.K.
http://209.187.119.118	The Currier Museum of Art contains an extraordinary collection of European and American art, with over 14,000 cataloged images.	U.K.
http:// www.arthurhughes.com	Most of the recognized 19th century and earlier names in the history of art around the world have their own Web sites with extensive digital reproductions of their oeuvre: ArthurHughes.com is devoted to member of the Pre-Raphaelite Brotherhood and contains over 4,000 images.	UK
www.bridgeman.co.uk	Bridgeman Art Library is largest commercial, multinational, historical art image agency.	UK
http://www.national gallery.org.uk	The National Gallery in London, we can examine the national and academic art gallery resources separately, because we may find the same or other images available at higher resolutions and for free. These images, as is the case with the National Gallery, may also be watermarked.	UK
http:// www.artifact.ac.uk	We can search for and access various kinds of visual arts resources from around the world through Artifact. The guide to quality Internet resources in the Arts and Creative Industries. One of the aggregate subject portals of the Resource Discovery Network (RDN), the gateway to art, design, architecture and media information on the Internet.	UK
http://www.tate.org.uk	The Tate collection holds more than 1,05,000 pieces of British and international art with over 90,000 digitized pieces. Search options are extensive.	UK
http://www.national gallery.org.uk	The National Gallery total numbers of artworks, including paintings are 4,200. The most comprehensive of its kind in the world.	UK
http://www.npg.org.uk	The National Portrait Gallery collection database contains illustrations for 32,870 of the 54,267 described portraits. The Victoria & Albert Museum's Access to Images database describes and illustrates more than 12,000 objects, including paintings and drawings collected since the museum's establishment.	UK
[http:// collage.cityoflondon.gov.uk	Corporation of London Library & Art Gallery Electronic, we search more than 25,000 images, from the Corporation of London Libraries and the Guildhall Art Gallery. Works in the collection date between 1550 and 1990 and digital images are watermarked.	UK
http:// www.collectbritain.co.uk	The British Library's new Collection Britain: Putting History in its Place, somewhat like the National Library of Scotland's Digital Library, features thousands of maps, views, prints and drawings, photographs and documents, advertising ephemera and rare early sound recordings.	UK
http://www.llgc.org.uk	The National Library of Wales and the National Library of Scotland offer growing and impressive digital collections that rival those of the British Library. Through the Treasures section of its Digital Mirror, the former offers a complete catalog with selected digital copies to its framed works of art and plans to digitize all its topographical prints for free Web access.	UK

URL	Description	Country
http://www.heritage-images.com	The Heritage Image Partnership Picture contains photographs and original artwork from leading British museums, libraries, institutions and archives that have accumulated and catalogued unique collections of photographs, illustrations, manuscripts, artworks and engravings...." There are 6,296 "Artistic Representations," 523 "Landscapes," 245 "Panoramas," 3,020 "Portraits," 18 "Seascapes," and 9 "Still Life's," with all results including original photographs.	UK
http://www.royalacademy.org.uk	As a work in progress and because of its importance to the history of British art, the small and growing online collection of the Royal Academy of Arts, founded in 1768. Non-British artists are also represented here. The collection, parts of which we can access through an illustrated artist index, contains 850 paintings, 350 sculptures, 500 plaster casts, 15,000 prints and drawings and 2,000 historic photographs.	UK
http://www.ashmol.ox.ac.uk	Oxford and Cambridge, maintain art galleries that span time, place, and types of art objects. Oxford's Ashmolean Museum of Art and Archaeology, "Britain's oldest public museum," features a range of online resources, from the AMOS Objects Seeker to specific object and visual resources databases.	UK
http://www.odl.ox.ac.uk	The Oxford Digital Library Collections is a convenient entry point into the university's art and art-related digitization projects. We can browse illustrated narrative catalogues.	UK
http://www.fitzmuseum.cam.ac.uk	Cambridge University's Fitzwilliam Museum, online catalog database, we can search for 1,23,958 records.	UK
http://www.artandarchitecture.org.uk	The Courtauld Institute of Art and Architecture portal, University of London, offers public access upon free registration to a large image collection from the Institute's own gallery. Nearly 35,000 image descriptions using a keyword search for art. 8,300 drawings and 485 paintings. The remaining images cover sculptures and architectural works.	UK
http://www.whitworth.man.ac.uk	The Whitworth Art Gallery features a collection catalog that describes 33,000 objects and offers black-and-white and color images.	UK
http://www.motco.com	The MOTCO UK Directory and Image Database feature a reference database of about 4,500 topographical prints, maps, prospects and panoramas of London.	UK
http://www.digital-librarian.com	For ease of use and organization, look first at The Digital Librarian, particularly in the Images and the Art pages.	USA
http://www.art-design.umich..edu	The University of Michigan's Mother of All Art and Art History Links Page sports a top-level section titled Image Collections and Online Art. All the pages of this guide contain annotated links organized into categories relevant to the section topic.	USA
http://www.bc.edu	At Boston College, Art on the Web boasts more than 1,200 art and architecture links, including a section devoted to Image Collections	USA
http://www.lib.ucdavis.edu	The University of California, Davis, University Library's Art and Art History guide offers a well-rounded set of Selected Internet Resources in Art and Art History arranged in four broad categories.	USA
http://andromeda.rutgers.edu	Comparable guides to earlier centuries with sections on art include Jack Lynch's Eighteenth Century Resources.	USA
http://www.art.com	In Art.com, we can search through a massive collection over 1.9 trillion product combinations of historic and contemporary art reproductions. The May 2004 American Business Awards honored Art.com as the best e-commerce site.	USA
http://wwar.com	World Wide Arts Resources, the largest arts site on the World Wide Web. The site offers free access to over 1,00,000 works by over 12,000 artists from around the world. Its Art History database, keyword searchable by artist name, claims to offer more than 2,50,000 images from cultural institutions around the world and to cover over 27,000 artists. In addition to online image links to specific museum collections for the historical artists, we may also find links on the same page to news stories, related sites and URLs for Metasearch Website Matches, that is, search engine results based on the artist's name.	USA

URL	Description	Country
http:// www.museumstuff.com	MuseumStuff.com has a database containing over 32,000 museum-related resources. Select the button labeled Art to go to the art directory. Many of the links point to other commercial sites, but this is a basic, point-and-click guide to art topics and selected artists.	USA
http:// www.seattleartmuseum.org	Seattle Art Museum, Search the permanent collection of more than 20,000 works.	USA
http:// www.albrightknox.org	The catalog to the entire Albright-Knox Art Gallery permanent collection offers thumbnail images for an estimated 6,300 objects.	USA
http:// www.gettyimages.com	Getty Images also contain images of posters and other kinds of commercial and fine art imagery.	USA
http://vos.ucsb.edu	The University of California, Santa Barbara, weave a comfortable pile of resources in the Voice of the Shuttle: Art & Art History section. Though the subsection Image, Slide, Print, Clip Art Resources is rather threadbare, the General Art Resources at the beginning does lead to art image databases.	USA
http://infomine.ucr.edu	Infomine: Scholarly Internet Resource Collections, University of California, covers the Visual & Performing Arts. A keyword search for "art" in every indexed field except Author revealed 1,656 expert- and robot-selected resources.	USA
http://www.tfaoi.com	Traditional Fine Arts Organization, Inc., publishes Resource Library Magazine America's Magazine for Representational Art, an excellent background tool that includes thousands of RLM illustrated articles and scholarly essays on American art along with illustrated profiles of historical American art collections	USA
http:// www.artcyclopedia.com	Artcyclopedia, the Fine Art Search Engine. Offering access to 1,60,000 great works of historic and contemporary art through direct searches. Artcyclopedia was one of 2001's Best Free Reference Web Sites awarded the American Library Association's.	USA
http://www.artstor.org http://www.jstor.org	ARTstor is funded by the Andrew W. Mellon Foundation and modeled on the highly successful scholarly journal archive JSTOR project. At launch, it delivered around 5,00,000 images along with software tools. Operating as an independent non-profit itself since January 2004, according to the FAQ, Like JSTOR, ARTstor will therefore charge institutional licensing fees to defray some part of ARTstor's ongoing operating costs. Ongoing development of ARTstor collections will be funded in other ways.	USA
http://www.bamp fa.berkeley.edu	Berkeley Art Museum and Pacific Film Archive (BAMPFA) maintains a free catalog to its permanent collection, with 2,800 downloadable, mid-resolution JPG images. BAMPFA and the California Digital Library also worked with California museums and archives on the Museums and the Online Archive of California (MOAC), project, which encompasses 92,000 images from 11 California museums.	USA
http:// www.perseus.tufts.edu	The Perseus Digital Library covers the Greco-Roman Classical world, as well as the European Renaissance. Although the site emphasizes classical texts, large visual repository nearly 92,000 images from institutions and individual researchers around the world relating to ancient Greece and Rome. Images and detailed records relating to architecture, sculpture, vases, coins, gems and sites.	USA
http:// museums.fivecolleges.edu/ lll/index.htm	An outstanding regional example of a public, multi-institutional database, the Five College Museums contains descriptions of over 90,000 objects accompanied by thumbnail images.	USA
http://worldart.sjsu.edu	California State University's WorldArt Kiosk offers over 65,000 art images searchable by keyword, browsable through various topic categories or "portfolios" which represent groupings of works by controlled vocabulary.	USA
http:// www.library.yale.edu/ walpole	Like many other campuses, Yale, Harvard and Cornell universities develop and offer internal and external access to extensive visual collections. Yale University's Lewis Walpole Library Digital Collection contains 25,000+ online images from a 19,000+ collection of English caricatures and political satirical prints from the late-17th through the mid-19th centuries. We can search only by keyword or call number through the library's own interface.	USA

URL	Description	Country
http://via.harvard.edu	Harvard University Library's Visual Information Access has one serious limitation for art image research. It doesn't allow searching by the format of the original item, the system offered 69,657 records.	USA
http://insight.library.cornell.edu	The Cornell University Image Collections accesses public art image collections such as the Louis Agassiz Fuertes Image Database 8,200 ornithological illustrations, Beautiful Birds: Masterpieces from the Hill Ornithology Collection, the Claire Holt Papers 1,733 images of Indonesian arts and crafts and the Herbert F. Johnson Museum of Art Collection 17,000 images through the Cornell University Library Digital Collections page.	USA
http://fmdb.cla.umn.edu	The Visual Resources Center 20,000 online images adopt the approach used by commercial agencies and provide thumbnail access to their online art images.	USA
http://gallery.unl.edu	The Gallery of the Open Frontier an online resource drawn initially from the primary collections of the National Archives contains over 23,000 searchable photographs and artwork.	USA
http://www.bluffton.edu	Bluffton College Digital Imaging Project features more than 15,000 images of sculpture and architecture taken at various sites around the world and dating back to prehistory. Although there's no search index, indexed the photographs by artist, site name and time period, making it easy and quick to find individual images.	USA
http://www2.art.utah.edu	The University of Utah's Images of Art and Architecture database contains around 7,000 digitized reproductions of works of art and architecture ranging from the period before written history through the 20th century.	USA
http://arthist.cla.umn.edu	Art Images for College Teaching may provide welcome relief including images of architecture.	USA
http://www.amico.org	Based in the U.S., the best-known and one of the largest examples of an international cooperative of public museums and galleries, the Art Museum Image Consortium (also known as the AMICO Library), founded by the Art Museum Network and features a publicly accessible thumbnail image database of more than 200,000 works of art.	USA
http://www.loc.gov	Library of Congress preserves vast quantities of artwork in the form of photomechanical and hand-press originals, as well as drawings. The Prints and Photographs Online Catalog page summarizes each collection	USA
http://memory.loc.gov	The American Memory digital collections can identify digital collections that feature printed artwork such as posters and many digitized historic books and magazines also contain art illustrations.	USA
http://www.nypl.org	The New York Public Library's NYPL Digital Gallery will feature more than 6,00,000 digital images from NYPL collections, including illuminated manuscripts, historical maps, rare prints, and photographs. We can view a number of smaller art images collections now through the Prints & Photographs category of the Digital Collections page.	USA
http://www.thinker.org	Thinker ImageBase, Fine Arts Museums of San Francisco, the largest public art gallery database in the U.S., contains over 1,20,000 images. The advanced search by keyword, artist, country, time period. No controlled vocabulary searches exist until we get to the database record itself, where we'll find hyperlinked related keywords.	USA
http://library.clevelandart.org	The Cleveland Museum of Art's Ingalls Library's Image Catalog describes a circulating collection of art images, some accompanied by thumbnails. The image catalog describes 84,000 online images.	USA
http://collections online.lacma.org	The Los Angeles County Museum of Art (LACMA) Collections Online Around 28,000 images accompany the database records.	USA
http://www.mfa.org	The Boston Museum of Fine Arts Collections Database represents one example of several North American and European museums whose online collections databases incorporate detailed information, along with images of European art from areas occupied by Nazi Germany during World War II. We can access over 48,000 online images from the total database of around 80,000 records.	USA

URL	Description	Country
http://www.nga.gov	The lots of online art at the National Gallery of Art, search the entire collection of more than 1,20,000 objects and view images for over 9,800 objects.	USA
http://americanart.si.edu	American Museum of Art, where we can search for more than 22,000 online images.	USA
http:// www.metmuseum.org	The Metropolitan Museum of Art features two outstanding databases of online images: the first, over 8,500 digital reproductions from the permanent collection and the second, the Timeline of Art History, which ranges in time from prehistory to the present.	USA
http://www.artsmia.org	The Minneapolis Institute of Arts provides keyword searching for over 5,000 digitized objects from its total collection of over 150,000 items that cover many different cultures over time and space. We can also use the collection guide and browse the 8,000 items by culture or medium.	USA
http://www.artres.com	Art Resource the worlds largest fine art stock photo archive, features 100,000 keyword-searchable fine art images licensable for commercial use exclusively in North America from the some of the best art museums and galleries in the world.	USA
http:// www.sothebys.com http:// www.christies.com	Auction houses are wonderful sources for online images, though usually on a temporary basis. Sotheby's and Christie's are two of the best-known multinational auction houses that feature browsable catalogs of upcoming and past sales, along with downloadable mid-resolution JPG images. Christie's does not provide online images for past sales.	USA UK
http:// www.princetonol.com	The wonderful collection of resource links especially serves the young artist and the young or old art fancier.	USA
http://www.artres.com	Art Resource in New York represents this service in North America.	USA
http://witcombe.sbc.edu	Sweet Briar College (Virginia) will lead through the time, place and types of artistic expression in a well-developed, clear taxonomy. It's one of the most referenced art history guides	USA

7. FURTHER RESEARCH

The further research would be more helpful in the areas i.e. "The cost effective model for image content creation, National depositories and copyrights clearance, Enhancement of non profit consortium and subscription to these services by education and research institutes."

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Library and Satellite Data Bank of HARSAC: A Dynamic Information Centre

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Abstract: Understanding the importance of remote sensing the government of India has established Remote Sensing Centres in 17 states. The library and Satellite Data Banks are equipped with the latest technologies and data in order to meet the informational requirements of the remote sensing scientists. The satellite data available in HARSAC is very debonair/ sophisticated and is handled with due care with the help of computer software. The paper describes the facilities available at HARSAC and the working of its library and satellite databank. Four softwares are being used in the Library and Satellite Data Bank i.e. the Libguru software- for the housekeeping operations of the library; Greenstone Digital Library- software for Institutional Repository and other two softwares namely 'Satellite Data Information System' and 'Geomatica'- for managing and making use of satellite data.

Key words: Digital Library, Libguru-Library software, Greenstone Digital Library software, Satellite Data Information System-GIS software, Geomatica-GIS software.

1. INTRODUCTION

1.1 Remote Sensing

Remote Sensing is the acquisition of data about an object or scene by a sensor that is far from the object. In other words Remote Sensing is the art of acquiring information of objects remotely. Remote sensing can be of many forms such as -Aerial Photography, Satellite Imagery and Radar Analysis.

1.2 Geographical Information System

A Geographical Information System (GIS) is complementary to Remote Sensing. It can be used to interpret remote sensing data more accurately by integrating them with data derived from other resources and can analyze large volumes of geographically referenced data. On the other hand satellite images can help to update efficiently certain data layers in the GIS.

Remote Sensing and GIS are technologies whose potential has yet to be fully explored. Nevertheless, many resource managers in both developed and developing countries have already benefited from these technologies in the fields such as town and country planning, water management, agriculture, forestry, conservation, mineral resource development and prevention and mitigation of natural disasters. Realizing the potential of the Remote Sensing technology, Department of Space, Government of India, has developed facilities related to Remote Sensing data acquisition from various satellites, data processing, data archival and distribution, training and other related needs of the user community.

2. HARYANA SPACE APPLICATION CENTRE (HARSAC)

Government of Haryana has set up Haryana Space Application Centre (HARSAC) under the certificate of registration of societies act XXI of 1860 on the 26th day of February 1986 at the campus

of CCS HAU, Hisar, with a view to derive benefits out of remote sensing technology for various developmental activities of the state. HARSAC, an autonomous body under the department of Science & Technology, Government of Haryana has been declared as the nodal agency for all Remote Sensing (RS) Geographical Information System (GIS) & Global positioning System (GPS) related work in the State of Haryana. All the line departments of Haryana Government are required to move through HARSAC for their requirement of RS, GIS & GPS related work. As per the notification, HARSAC would also act as the centralized location for creating, storing, analyzing, retrieving and supply of spatial data to all the user departments of Haryana Government. It has emerged as a major repository of information for the users and likely to become an integral part in the planning process of the state.

The emerging scenario is the combination of the availability of data products, the facilities for processing of the digital data and the research trends. There are pressing demands from the government and the public to tap this vital source of information to solve the day to day problems of the state like floods, droughts, drinking water, town and country planning and many more. GIS has also emerged as a very effective decision support system for development planning. Therefore, various line departments dealing with geo-spatial databases need to prepare themselves to make use of the state-of-the-art technologies so as to make governance more efficient, effective and transparent.

The HARSAC is well equipped with advanced facilities to carry out Remote Sensing & GIS activities. Some of them are listed below:-

Computer & Data Processing Unit: the centre has a facility to accommodate 50 users at a time to access the information. This unit is being looked after under the supervision of Assistant Scientist and supported by technical staff.

Visual Interpretation: In the visual interpretation laboratory Prevom-2, Optical Pantograph, Zoom Transferoscope, Optical Reflecting Projector and Dynascan Magnifiers with illuminating magnifiers were procured for the visual interpretation of the satellite data.

Ground Truth Instruments: For the collection of the ground truth information the centre is having ground truth radiometers, field cameras, conductivity meter, pH Meter, water level recorder etc.

Photographic Unit: In the photographic unit, the centre is having colour composite printer-cum-enlarger, colour processing unit, B2 enlarger etc.

Digital Cartographic Unit: The cartography unit is having two digital planimeter, Z0 size Xeroxing machine, ammonia plain printer and lamination machine to carry out the day to day cartographic work.

Training & User Interaction: Harsac is organizing trainings and awareness programs, workshops and seminars and providing guidance to research scholars.

3. LIBRARY AND SATELLITE DATA BANK

The Library of HARSAC is catering to the informational needs of scientists and other user agencies. Library collection includes books, journals, magazines; research reports newspapers and satellite data etc.

Library Collection

The Library has a collection of books, journals, databases covering various subjects like remote sensing, soils science, agriculture, water management, land use, geography, computer science, environment, forestry, census, gazetteers and reference books etc.

Library Automation

HARSAC library is using Libguru software for automating library activities which is developed by Spring Time Software Company, New Delhi. This software supports the following housekeeping operations of the library:-

- Acquisition
- Cataloguing
- Circulation
- Serials
- OPAC
- Reports
- Tools

The Library has developed the complete databases of library members and library collection.

Institutional Repository

HARSAC has published the results of various kinds of projects in the form of technical reports. Till date, 97 reports have been published and are available in the Library for reference to the users, agencies, other institutions and related organizations for planning various developmental programs on agriculture, water management forest cover mapping, wasteland etc. For making best use of these reports, the Institutional repository is being build up by using Greenstone Digital Library Software. The repository makes the searching and retrieval very easy. First of all the files related to repository are attached by using greenstone software, necessary bibliographical details are assigned, icon is designed and repository is build up for use by the members.

4. SATELLITE DATA BANK

HARSAC library has the following databases: Aerial Photographs, Satellite Data (Paper Prints, Diapositives (CCT's), CDs and DVDs and different resource maps at different scales covering various themes. The library receives data, keep records, processes, stores and maintains the satellite data for its retrieval and use by the scientists of Harsac.

Considering the importance of the activities carried out in the area of aerial and satellite remote sensing, the National Remote Sensing Agency (NRSA), an autonomous society under Department of Space (DOS) has been converted into a full-fledged Government organization called National Remote Sensing Centre (NRSC) from today (September 1, 2008). National Remote Sensing Centre (NRSC) provides end-to-end solutions for utilization of data for natural resource management, geospatial applications and information services. NRSC facilitates several remote sensing & GIS application projects for natural resources and environmental management catering to food security, water security, energy security and sustainable development. NRSC is also providing single window, disaster management support services through the Decision Support Centre

The basic source for the procurement of satellite data in HARSAC is the National Remote Sensing Centre (NRSC) located in Hyderabad. The NRSC, Hyderabad maintains and manages facilities for acquisition, storage, retrieval and dissemination of satellite data. The IRS-IA and IRS-IB are identical and are providing data with a combined receptivity of 11 days.

The data from various sensors have to be presented in a form and format with specified radiometric and geometric accuracy which can be readily used by various application scientists for specific themes of their interests. This may be in the form of photographic output or in a digital format available for further computer processing. The remote sensing data products, which are available to the users, may be in the following forms;-

A. Photographic products such as paper prints, film negatives,

B. Diapositives of black and white and False Color Composite in a variety of scales.

C. Digital form as CCTs, DATs, floppies, CDs, DVDs.

Remote Sensing data is processed and analyzed with computer software, known as a remote sensing application. A large number of commercial and open source applications exist to process remote sensing data. The software used to access the satellite data at HARSAC library is called Satellite Data Information System.

After the launch of IRS series of satellites the use of digital satellite data has increased by many folds in the recent years and will increase in the years to come. The data consists of various satellites, sensors, products and geographical locations. It is very essential to have a query based - 'data retrieval and information system' to obtain information regarding the satellite data available with the user.

Satellite Data Information System (SDIS) is a menu driven user-friendly software to automatically create a database of all relevant information about satellite data and then to access their information for any geographical location of India. The queries can also be made based on path-row, date of pass, satellite, sensor etc.

This software is described in two modules

1) Database creation

2) Information Retrieval

1. Database Creation

This is the first step to be performed for storing the information about all satellite data archived. In the "Load Record" option, name of 'Leader File' is to be provided. It automatically reads all the relevant information about satellite data and is displayed on the screen. User is supposed to provide 'local CD number' for handling the data. "Save" option stores the data into the database. This process has to be repeated for all the archived satellite data. The data is stored in MS-Access database named 'Salellite.mdb'.

It stores information like satellite, sensor, path-row, date of pass, time of pass, pixels, lines, bands, gain number, scene center, saturation radiances, sun zenith and azimuth angles, etc.

2. Information Retrieval

Once the database for all the archived data is created, the system become ready for data retrieval based on user's query. India has been divided into six zones viz. North, South, East, West, Central and Andaman & Nicobar Islands. User has to choose the desired zone from the option 'Select Zone' and it is displayed on the terminal with corresponding states.

After the selection of desired zone information about all the satellite data for a particular geographic location can be obtained by any of the following queries:

(i) Double clicking on the map at desired location

(ii) Providing Latitude and Longitude of the location

(iii) Selecting a city / town for the available list

(iv) Selecting a Survey of India (SOI) toposheet on 1:250000, 1:50000 or 1:25000 scale

(v) Query based on satellite, sensor, date of pass, path-row etc.

Query based on Satellite parameters are discussed below:-

Apart from queries based on geographical locations as explained above, one can also make queries based on satellite parameters, from the database. The queries can be made on path-row, satellite, sensor, date of pass etc. A combination of these parameters can also be given. 'Run Query' gives the list of satellite data satisfying the given query. Plotting of data on the maps and other queries can be carried out.

You can also print the selected satellite data as well as all satellite information regarding the query made by you.

Digital Data Analysis:

The digital nature of the satellite data makes it amenable to digital (computer) analysis. A digital image comprises of a number of individual picture elements called pixels, each one of which has an intensity value and an address in two dimensional image spaces. The intensity value of a pixel which is recorded in the form of digital number (DN) is dependent upon the levels of electromagnetic energy received by the sensor from the earth surface. The digital image processing is a blend of computing hardware and software which is designed to undertake many parallel computing operations under the management of a host computer.

Digital image analysis and Map Composition work was carried out at HARSAC, Hisar on Work Stations (HP Visualise) UNIX based and other Systems using Geomatica and ARC/MAP software packages.

Digital Data loading:

The digital data was imported from the Computer Discs (CDs) on UNIX Work Station using the standard routines from the **Geomatica software** in Pix format. Geomatica version 8.2 is a product of PCI, Ontario, Canada. The digital data was displayed on the display terminal in different band combinations and enhancements to observe quality and coverage of the data.

Geomatica is a simple application which shows an icon for each of the major PCI application: Focus, Ortho Engine, FLY!, PCI Modeler and others. Each application can easily be started by clicking on its corresponding icon. A single icon containing four smaller icons allow access to the PCI corporate logo, help, vertical or horizontal layout and Geomatica exit.

Only the icons for those executables with the same version as Geomatica will show up in the Geomatica tool bar. Normally Geomatica is automatically started upon login by appropriate use of the .login .profile or LOGIN.COM files or by typing Geomatica to a prompt in a terminal window.

The EASI icon will open a terminal window and run EASI within.

Image work is an interactive application for viewing and manipulating image, graphic and vector data from a variety of file formats.

X pace is an application for setting up and running EASI/PACE program.

GCP Works is an interative application for performing image registration, mosaickin and radiometric correction. GCP Works is standalone; and supports a number of image and vector file formats.

PCI Modeler provides methodology for the development of both simple & complete data processing flows.

The data generating by remote sensing procedure become information when someone understand their generation, knows to interpret and how best to use them.

5. EDUSAT NETWORK BASED PROGRAMS

Vigyan Prasar (VP) is an autonomous organization under Dept. of Science and Technology, GOI, is engaged in large-scale Science Popularization programs. ISRO successfully launched the Edu Sat (Satellite for Education, Science and Technology) and is operational now. Utilizing the Edu Sat network, Vigyan Prasar (VP) established talk back terminals at various locations spreads across the country. The main objective of this Satellite Interactive Terminal (SIT) is primarily for Science Communication and development of discussion groups, live lectures, and demos with the interaction of the participants. Under this program various programs were telecasted which are related to Popular Science topics such as Solar Eclipses, Modern Physics kits, Evolution etc.

Recently HARSAC has undertaken the responsibility of popularization of Science & Technology in the state through Popular Science Lectures, Environment and Nature exploration programs to be disseminated through Edu Sat (Education Satellite). At the behest of Vigyan Prasar, Department of Science and Technology, GOI, a Satellite Interactive Terminal (SIT) has been established at HARSAC with a talk back facility. The main objective of this program would be to build the capacity building, distance training, access to expertise, and countrywide debates on science- society issues. Under this program, selected topics would be broadcasted from Vigyan Prasar studio in Delhi through Edu sat and the teachers and students can listen and interact with the experts sitting at Delhi studio through Video Conferencing. Most of the topics covered under this program are related to Science, Environment, Nature Exploration and Carrier guidance.

6. USE OF GIS IN LIBRARIES

GIS has traditionally been used in areas like land use, urban planning, natural resources etc. Now GIS has opened the gateway to a variety of applications in various fields like banking, health and other utility services. Efforts are made to use GIS in libraries also with a view to provide a tool for finding physical location of library material. It is observed that libraries are trying to use GIS in library services. But it may not be possible to accept and implement the ideas and concepts immediately as these are very new to the field of library science as well as library professionals are not aware that it has a management application. But GIS needs to be marketed as a management tool for libraries in future. No doubt GIS will add new dimensions to the existing library system

7. CONCLUSION

Remote Sensing and Geographical Information System has been emerged as significant disciplines for the human civilization. It covers the important social fields such as town and country planning, water management, agriculture, forestry, conservation, mineral resource development and prevention and mitigation of natural disasters. If the accurate information is provided to the scientists at the right time, the same can be used in the respective fields for better planning and forecasting leading to better utilization of natural resources. In remote sensing and GIS, satellite data constitute the major ingredient

for processing. The Library and Satellite Data Bank is providing such services to the scientists of Haryana Space Application Centre, Hisar.

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Requirement Analysis for Developing Digital Library Having Institutional Digital Repository in the University of Kalyani by Using GSDL: A Pragmatic Approach

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Abstract: Here we attempt to plan to create and manage a digital library using GSDL in the Central Library of University of Kalyani. We describe overview of digital library having Institutional Digital Repository (IDR) and GSDL for better understanding the environment of creating the digital library. We provide the estimates regarding financial and other requirements for establishing the digital library. In this article we attempts to give standard requirements. It may be helpful for other institutions of same nature for building digital library.

Keywords: Digital library, Institutional repository, GSDL, University of Kalyani

1. INTRODUCTION

In the year 1961 after the inception of the Kalyani University the Central Library had no building of its own. In 1997 Central Library had its own separate two-storied building. The location of Central Library is central to the most of the departments and administrative building. It has rich collections of various types of documents including special and private collection. Library has taken automation programme for its house-keeping works. The Central Library has procured CDS/ISIS software package developed by UNESCO and created a database comprising of near about 37000 documents. Later in 1997 SOUL software was installed for total library automation. Till now approximately 5000 documents were converted into SOUL and 5000 new records were incorporated into the SOUL. Very recently we have developed a prototype digital library in the Central Library by using. Before creating full-fledged Digital Library we must have appropriate arrangement of the different sections/ units of Central Library. Because Digital library must have logical relation among the different sections of the library and the different departments of the university.

Creation of digital library involves many prerequisite and technical issues. Before the creation of digital library by using GSDL we have to know – what is digital library? What are the components of digital library? What are the technical issues for the development of digital library? How Institutional Digital Repository (IDR) or simply repository is related to digital library? It will be very much relevant to enumerate all the elements and components of digital library and institutional repository. In the present study we loosely use concept digital library creation by using GSDL. Actually GSDL is only used for creating IDR and IDR is the part of digital library.

Before go through the context we have to know about the physical layout of Central Library. Central library is a two-storied building. The present arrangement of different sections of Central library needs to be in mind before creating digital library.

2. DIGITAL LIBRARIES

Digital libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities. Digital library was viewed as system providing a community of users with coherent access to a large, organized repository of information and knowledge...The ability of the user to access, recognize, and utilize this repository is enriched by the capabilities of digital technology;.....

According to 5S framework of Fox, in 1999 digital libraries are complex systems that:

- **Societies**: Help satisfy information needs of users
- **Scenarios**: Provide information services
- **Spaces**: Locate and present information in usable ways
- **Structures**: Organize information in usable ways, and
- **Streams**: Communicate information with users and computers

2.1 Components of digital library

To build digital libraries we must ensure that each of the "S" constructs is addressed, and so can use 5S as a checklist or guideline. In operational terms, however, many digital libraries are built out of components that are integrated into a production quality system. There are several components for creating digital library.

2.1.1 Digital objects

The actual content of digital libraries is made up of a number of digital objects. In some cases these may be thought of as data sets (e.g., a table of results, the genomic information for an individual). In others they may be multimedia information, such as an image, graphic, animation, sound, musical performance, or video. Digital Object has the following components (Figure-3).

1. Handle:

The handle is a unique identifier. The following are desirable properties of identifiers in the digital library:

- Location independent name
- Globally accessible unique names
- Names that are persistent across time
- Choice of automatic generation or use of assigned names
- Fast resolution of identifiers
- Replication and caching of objects and resolvers
- Decentralized administration
- Change control
- Support from standard user interfaces

2. Content:

The content is a sequence of bits or a set of sequences of bits. The content of digital objects is defined as sequences of bits, but in most practical uses those bits have structure and semantics. Sets of objects

can be represented in the digital library in two ways, composite objects, in which the content contains a set of objects (Figure-3), and meta-objects, in which the content includes handles for a set of objects (Figure-4 & 5). Combinations are also possible.

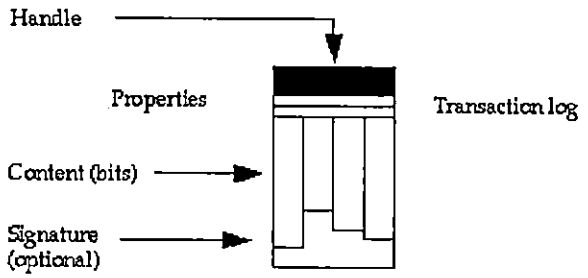


Fig. 3: Components of digital object

3. *Properties:*

The associated properties information is used to record properties, such as rights, formats etc. Information associated with a digital object is called properties. This information can be considered from various viewpoints, including the type of information, who creates it and where it is stored.

- Types: There are many types of properties including: bibliographic information (content), technical (formats, schemas, protocols), rights (ownership, terms and conditions), administrative, etc.
- Creation: The originator of the object, an administrator, third party, etc can create Properties.
- Storage: Properties are stored in many places, including: properties records, meta-objects, separate digital objects, information retrieval servers, external indexes, etc.

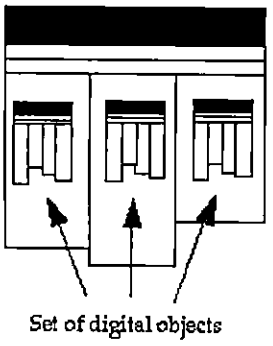


Fig. 4: Composite object

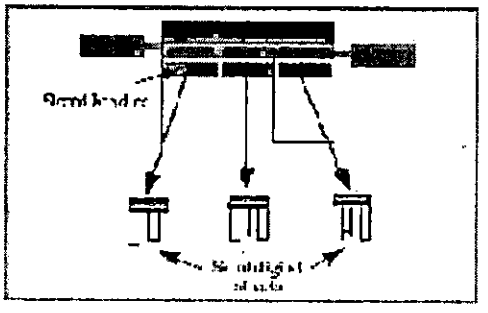


Fig. 5: Meta-object

4. *Transaction log:* The associated transaction information is used to keep a log of uses made of the object.
5. *Signature:* The optional digital signature guarantees that the object has not been altered.

2.1.2 Metadata

Digital objects are described, structured, summarized, managed, and otherwise manipulated in surrogate form through the use of "metadata", which literally means data about data. Three types of metadata are often distinguished: descriptive, structural, and administrative. Metadata is usually produced through a process called "cataloging" that is often carried out by trained librarians. Collections of such information are commonly stored in "catalogs".

2.1.3 Repositories and Harvesting

Digital library contains a collection of digital objects (DOs), each of which has one or more sets of metadata objects (MDOs) associated stored in the repository. This "repository" part of a digital library may, as is the case in the Open Archives Initiative, follow certain. In particular, according to the latest specifications, an "Open Archive" (OA) is a computer system with a WWW server that behaves according to an OA protocol to allow other computers to harvest metadata from it.

2.1.4 Rights Management

In repository there is the "rights manager" which must protect intellectual property rights. In the trivial case, which fortunately is common, content is freely available so nothing is needed here. In some cases too, where content is encrypted, content management is outside the scope of the digital library, since secure objects are stored and retrieved and the steps of encryption and decryption occur remotely. Similarly, some content may have "watermarks" added in a way that makes removal difficult, so that subsequent access outside the digital library can be monitored or controlled.

2.1.5 Indexing, Resource Discovery, Searching, and Retrieving

Finding DOs, directly or through MDOs, so that they can be identified, retrieved, and used. Often, DOs and/or MDOs are automatically indexed so that some index structure is built to speed up search. Such indexing may build upon any manual indexing carried out by authors, other creators, or indexers. Automatic indexing also may involve first classifying Dos.

2.1.6 Linking, Annotating, and Browsing

Once a DO is found, it often is appropriate to follow links from it to cited works (or vice versa). Further, notes can be recorded as annotations and linked back to the works, so they can be recalled later or shared with colleagues as part of collaborative activities. Browsing also can proceed based on any of the elements in the MDO.

2.1.7 Interfaces and Interaction

Ultimately, users will connect through a human-computer interface and interact with the digital library, though in some cases the digital library may be an embedded system that is seen only indirectly (e.g., through a word processor that allows one to search for a quotation). Most commonly, a digital library has an interface for users to search, browse, follow links, retrieve, and read documents.

2.1.8 Architectures and Interconnecting

Since the field of digital libraries is young, there still is active investigation regarding architecture, interconnection, and interoperability (Paepcke, Chang, Garcia-Molina, & Winograd, 1998). According to them interoperability is not just an issue of inter-component communication, but that it needs to be considered in many different functional parts of a system. Interoperability is a central concern whenever digital libraries are constructed as collections of independently developed components that rely on each other to accomplish a larger task.

2.2 Services and information resources in digital library

2.2.1 Current Awareness Service

It contains scanned image of the title page of the printed journals subscribed by the Central Library of our University and the list of newly added books in the library.

2.2.2 E-Journals

Different e-journals through consortia are to be hyper-linked here. Users may access to the e-journals those, which are subscribed through this link. We are now subscribing e-journals of UGC-INFONET consortia, ScienceDirect. Here we also planned to tag different free e-journals on different subject areas available in the web.

2.2.3 E-Books

It contains different subscribed e-books, e-books in CDs accompanying with the books, born digital purchased books and digitized books through scanning. It may contain different free e-books available in the web, which are relevant to the particular subject.

2.2.4 Bibliographic database

Electronic bibliographic database if any subscribed by the university. Now we are subscribing DELNET database, INFLIBNET database and other databases included in the UGC-Infonet consortium.

2.2.5 Web resources

Various web resources those, which are very much important for the users for their academic purposes, are linked here.

2.2.6 Access to University home page

As the digital library is basically act as portal of the university, it must have the provision of linkage of university home page.

2.2.7 Reference sites

It contains department-wise mostly used sites by the users of the same department. It also contains different free web resources, which are very much useful for the purpose of reference services. These are Encyclopedia, Dictionary, Bibliography, and Biography etc.

2.2.8 Web enabled OPAC

It is Online Public Access Catalogue of the documents, which are already included in the SOUL database in our Central Library.

2.2.9 Institutional Digital repository (IDR)

A convenient definition is a "digital collection capturing and preserving the intellectual output of a single or multi-university community". Generally most of the people do not make any difference between digital library and institutional repository. But technically repository is the part of digital library. Digital library concept is very much wider coverage. It is basically a portal, which may include home page, e-resources, subject gateway, web resources, repository etc in a wired environment. Here GSDL is used basically for creating IDR. Digital library is basically an interface of all information services and products with respect to an organization/ institution. Using HTML, XML etc, can create this interface. An **IDR** is an online locus for collecting and preserving — in digital form — the intellectual output of an institution, particularly a research institution. For a university like us, this would include materials such as research journal articles before (preprints) and after (postprints) undergoing peer review, and digital versions of theses and dissertations, but it might also include other digital assets generated by normal academic life, such as administrative documents, course notes, or learning objects.

The two main objectives for having an institutional repository are:

- to provide open access to institutional research output by self-archiving it;
- to store and preserve other institutional digital assets, including unpublished or otherwise easily lost ("grey") literature (e.g., theses or technical reports)..

2.2.9.1 How do people use our Institutional Repositories?

Universities and research libraries around the world use institutional repository in the following ways:

- Scholarly communication
- Storing learning materials and courseware
- Electronic publishing
- Managing collections of research documents
- Preserving digital materials for the long term
- Adding to the university's prestige by showcasing its academic research
- Institutional leadership role for the Library
- Knowledge management
- Research assessment
- Encouraging open access to scholarly research
- Housing digitized collections

Each university has a unique culture and assets that require a customized approach. The information model that best suits your university would not fit another campus.

2.2.9.2 Collections in the proposed repository of University of Kalyani

It contains different digital objects within different collections. These collections are grouped under different sub-communities and different sub-communities under different communities and so on. The probable communities and collections are schematically shown below:

Out of all the components of digital library mentioned above, Digital Repository is the most important one for any University like us. The digital repository within the digital library is an asset for any institution. Digital repository is the collection of all intellectual works of our University capturing in digital format, managing for dissemination of and preserving of services. Actually it exits as a complementary of traditional scholarly communication. Effective repository is collaboration among librarians, computer professionals, archives and record managers, faculty and university administrators and policy makers.

There are various advantages in setting up a digital repository in our university. Such as:

- Institutions around the world will gain from a more efficient and most cost-effective system of scholarly communication.
- Digital repository also enables to publicize its research and teaching programmes by enabling access to the works of university staffs and students.
- Our digital repository will be an effective advertising way of our university by unfolding its qualitative academic outputs.

- It is an effective way of storing and making the documents accessible to authorized users.

Therefore we need to organize the collections within the repository systematically. A proposed model has been developed for better understanding of the repository collections. The proposed model provides landscape solution, hardware and software requirements, manpower and infrastructure requirement.

2.4 Requirements with costs for Creating Digital Library/IDR in Kalyani University

2.4.1 Infrastructure requirements

Actually digital library has no such physical existence. It must be accessed through the official website of the University via clients connected to the University LAN. At first phase users may use digital library through the terminals in CIRM and the computers connected to the University LAN. Later on after the completion of the 2nd floor of the library building separate digital library room having 60 terminals will have to be developed in the existing Periodical and Thesis Sections. Then the Periodical section, Thesis section, Meeting room etc will be shifted to the 2nd floor of the library building.

The present Server and Meeting Room will be converted into the Server room for creating and managing digital library and library automation. Therefore besides SOUL server for library automation, it must have the provision for installing Digital library servers, SAN storage technology and Scanner for digital library. The Server room will be like:

3. PROPOSED USER INTERFACE OF THE DIGITAL LIBRARY

The proposed user interface of digital library hyperlinked to the official website of the university will directly accessible through a separate IP address provided for the purpose.

4. CONCLUSION

The present study is a unified attempt to develop digital library in the University of Kalyani. Here we tried to enumerate basic features of repository/institutional repository and other components and features of repository and digital library. The main emphasis is given on the requirements for developing digital library.

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Restructuring the LIS Curriculum: A step towards Digital Libraries

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Abstract: The nature and role of libraries have changed in response to the new digital environment, with new application and services being developed. The changes are being witnessed in the digital workplace. As a consequence, there is demand for digital librarians who can adapt and accept the challenges of the present environment. New strategies need to be developed so that the LIS professionals are competent and confident to work in the electronic environment in the 21st century. The paper tries to highlight why it is necessary to restructure the LIS curriculum. It also provides the changing role of LIS professionals and gives a few suggestions that need consideration while restructuring the LIS curriculum.

Keywords: LIS Curriculum Development, Digital Libraries

1. INTRODUCTION

The Library and Information Science Education (LISE) is witnessing a vast change, upheaval and revolution today. With the changing environment caused by automation digitization, communication technologies, networking and globalization, etc, there is considerably as increased need to change it into a more interactive forum. In the recent past this discipline has show us a phenomenal growth from "Library Science" to "Library Science and Documentation" to "Library and Information Science" to "Information Science" to "Information Science and Information technology".

Today we are in the age of Digitization and Digital Libraries (DL). Hundreds of millions of dollars are being invested in digital library research since 1990, and also how Digital Libraries can aid education. However there has been little or no parallel investment to support teaching and learning about Digital Libraries. It is felt that to move to the next level of development in the Library and Information Science discipline, there is dire need for investment in the education of information professionals who fully understand the process by which Digital Libraries are developed and how Digital Libraries can help in providing novel information services to the users.

The educationist in India are of the opinion the emerging demands for Digital Librarian and Digital Libraries may warrant restructuring and reframing of LIS curriculum in India.

2. NEED FOR CHANGE IN THE LIS CURRICULUM

The nature and role of libraries have changed in response to the new digital environment, with new application and services being developed. The changes demand for the need to educate the library professionals in such a way that they are able to work in the dynamic and complex digital environment. These changing needs demand for a change in the Library and Information science education programs that is appropriate enough for preparing Digital Librarians for their workplace.

- To design such programs one needs to:
- Review the existing curricula in the library schools.
- Identify areas where new courses need to be developed.
- Identify existing courses which need updating.

- Identify areas where LIS staff (faculty) need to acquire new knowledge and skills in order to provide new courses or update courses.
- Provide the existing LIS staff (faculty) with opportunities to acquire new knowledge and skills example Distance education courses or attend training events/workshops, etc.

The LIS curricula should be designed and developed in such a way that the present and future library professionals are equipped with skills and competencies along with the core knowledge of different aspects of Digital Library so as to implement the Digital Library successfully.

3. OBJECTIVES OF THE LIS CURRICULA FOR DIGITAL LIBRARY ENVIRONMENT

The ideal curricula for Digital Library should take into account the following objectives:

- To familiarize students with the principles of Digital collection building, text and images.
- To be able to digitize materials using appropriate digitization procedures.
- To provide theoretical overview of image collections and practical experience to build a digital collection.
- To understand the organization, access, quality and sustainability components of image collection.
- To enable students to acquire practical knowledge and skills so that they are able to independently maintain and secure access to digital collection.
- To be able to analyze policies, practices and standards related to content development and management in the digital environment.
- To be able to understand descriptive cataloguing problem and issues for e-resources.
- To enable students to understand use of metadata for e-resources description and organization.
- To be able to design and implement new metadata structures and also be able to develop criteria for evaluating existing metadata structures.
- To enable students to evaluate and compare different data presentations, user interfaces and search facilities adopted by Digital Library.
- To discuss the role of Digital Librarian and Information professionals in planning, creation and management of Digital Libraries.

4. FRAMEWORK OF LIS CURRICULUM FOR THE FUTURE DIGITAL LIBRARIES

Studies have proved that R & D in Digital Libraries will sustain only if it has a strong theoretical foundation. Such a foundation would be useful in guiding work in curriculum and education materials. For this, Fox and his students at Virginia have been developing a formal model based on "Stream, Structures, Spaces, Scenarios and Societies," very popularly known as "5S" model. 5S uses fundamental material and computer science formalities, such as sets and graphs that are expressive and useful to capture all aspects of the social philosophical technological and economic/ ethical elements related to Digital Libraries. The 5S has been successful in providing formal framework and checklist for Digital Libraries development. It ensures in describing precisely definition of all key ideas and important concepts in the field of Digital Libraries.

Table 1: 5S model

Ss Examples	Formalization	
Streams	Text, video, audio, image	Sequence (list)
Structures	Collection, catalog, hypertext, document, metadata, taxonomy	Graph, Function, Relation
Spaces	Used in indexing, browsing, and searching services – as well as interfaces	Set (vector, topological, measurable, measure, probability spaces)
Scenarios	Searching, browsing, Recommending	States, events, sequences (lists)
Societies	Service managers (software), Actors (learners, teachers, etc.)	Tuple (relating events and actions)

It is however equally important to involve Digital Library community to help in the development of Digital Libraries curriculum and also to assess and decide the suitable methods of teaching. The emphasis should be on combination of lectures, tutorials and practical including group work. Students should also be encouraged to use library and computer facilities to support and broaden their learning.

5. ROLE OF DIGITAL LIBRARIES IN MANAGEMENT OF DIGITAL LIBRARIES

There is a major shift in the role of Digital Librarians for the management of Digital Libraries. The Digital Librarian is required to have deep knowledge and skill across the dimension of traditional library knowledge, technology and human relations. He is described as:

- Guardian of Information Superhighway,
- Guardian of global Digital Libraries,
- A symbiotic human machine guru.

The important skill and tool necessary for him to play his role successfully are:

1. Navigation, browsing and filtering,
2. Multimedia search and indexing,
3. Knowledge and data mining,
4. Search and retrieval coordination,
5. Digital Libraries interface, functions and roles in management of Digital Libraries,
6. Digital information access.

The LIS curriculum therefore should aim not only to familiarize students with theoretical and practical aspects of Digital Libraries but should also aim to help in creating Digital Librarians who can relate to Digital Libraries applications with confidence during their professionals lives.

6. RECOMMENDATIONS FOR RESTRUCTURING LIS CURRICULUM

On the basis of the above it can be concluded, that:

1. The management of Digital Libraries is some what different from other type of libraries and Information centres. It is therefore necessary to revise the LIS curriculum to equip the LIS professionals as per requirement of the Digital Libraries in particular.
2. Since the Digital Libraries has a different set up and collection is recommended that specialized knowledge should be included in the course of Digital Libraries curriculum.

3. It is suggested that minimum infrastructure facilities should be provided in Library schools/ Departments by giving sufficient funds for sustaining such courses.
4. Assessment and accreditation of Universities/Colleges by any controlling authority at the national level to assess the quality of products and services of a Digital Libraries.
5. E-Learning techniques need to be introduced to improve quality products with minimum qualified teachers.
6. Developing competency and confidence among LIS professionals by imparting knowledge of latest technology.
7. Keeping liaison between LIS educationists and the library professionals for providing training in specialized courses.
8. To revise and update the syllabus as per current demands and as per global necessities, with consideration of regional requirement.
9. The educational program should be supported by training and study workshops for practical exposure.
10. For maintaining the level of equivalency all over the country UGC and other national level professional associations like ILA, IASLIC, and IATLIS etc should make provision of modular course for the development in the field of Digital Libraries.

7. CONCLUSION

The LIS has witnessed rapid change due to changing environment caused by information technology, communication and automation, etc. Today the world has shrunk into a global village bridging the gap between people, countries, technologies and information. There is obviously the need for newer ways of information acquisition, processing storage, retrieval and transmission. We have entered into the age of Digital Libraries and many pilot studies are being undertaken on Digital Libraries and it implementation. However it has been realized the investment on Digital Libraries projects has been more than investment in actual implementation of Digital Libraries. Further there is great need for investment in the education related to Digital Libraries without which we will face a future with many Digital Libraries but very few Digital Librarians to ensure their success. We might run the risk of developers of Digital Library building software that is seriously flawed, as the developed will be unaware of problems related to efficient and effective techniques of implementation of Digital Libraries. It is highly recommended that up to date and effective training should be provided to information managers because of the world wide cut throat competitive environment. The information users are largely influenced by ICT. The changing needs of library users also call for good IT skills among library professionals.

Therefore all these rapid changes demand for a significant revision of the course content and program direction of LIS so that a relevant curriculum is designed to educate information professionals for the Digital Library environment.

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Role of Digital Libraries in Higher Education

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1. INTRODUCTION

Information Technology (IT) plays a vital role in the development of socio-economic, cultural, political aspects of a nation. It has become the most widely used and pronounced buzzword of the computer industry. It has helped all walks of life in one way IT is the modern science of gathering, Storing, manipulating, processing and desired types of Information in a Specific environment. Computer Technology is very useful in information storage and dissemination to the users/readers.

India is one of the oldest civilizations of the world. It covers an area of 329 million hectares extending from the snow-covered Himalayan ranges to the tropical rain forests of the south. According to the 2001 census, the total population of India is 102 crores, accounting for about sixteen per cent of the population of the world. In terms of land area, India accounts for 2.4 per cent of the total land area of the world. Between 1991 and 2001 the population of India grew by 200 million and the compound annual growth rate of population was 2.11 per cent. India, a union of states, is a Sovereign, Socialist, Secular, and Democratic Republic with a Parliamentary form of government. India comprises of twenty-eight states and seven Union Territories.

India is a developing economy with a per capita income of $ 572 in 2004. Its share in the world GNP is one per cent, though its population accounts for about sixteen per cent of the world population. The occupational pattern of India is typically that of an underdeveloped economy with about sixty nine per cent of its labour force engaged in the primary sector (agriculture, livestock, forestry, fishing, plantations, etc.,), thirteen per cent engaged in the secondary sector (mining, manufacturing and construction) and about eighteen per cent in the service sector (trade, commerce, transport and communications, personal and community services).

2. EDUCATION IN INDIA

Education is an essential tool for the manifold development of an individual. "Education is a sure and tried instrument of development. Hence, efforts have been increasing for speedy spread of education all over the world. The formal system of education has failed in providing lifelong continuing education and in extending the benefits of education to employed and handicapped persons, housewives and persons from weaker sections who are either unable to attend educational institutions or have missed the opportunity of securing knowledge under the conventional system of education.

At the time of Indian independence in 1947, only 18.3 per cent of its population was literate. By 1981, the literacy rate improved to 43.4 per cent. It was 56.4 per cent among males and 29.8 among females. With reference to the population aged seven years and above, the 2001 census revealed that the literacy rate had improved to 65.38 per cent.

Education is an integral part of the country's development process. Continuous and concerted efforts during the last four decades have resulted in a fourfold increase in the total number of literates. The number of universities increased from 27 (1950-51) to 300 (2002-03). With quantitative expansion of educational facilities, now the emphasis is shifting to qualitative improvement. The emphasis is also shifting from expanding the formal system to developing open learning/ distance education.

3. HIGHER EDUCATION

Higher Education in the century is passing through a crisis. The campuses of the Universities are crowded and there is a total lack of aptitude of higher education and research in the university departments, more so in the conventional universities. Inspite of this the number of universities is increasing because of political and regional considerations for the establishment of universities in the country. The teaching has become more or less uninteresting to the students because of type of instructions and other stereotype method of teaching. The Universities are not able to undertake any large-scale changes in teaching methods because it involves huge amount of financial resources to introduce teaching technologies to modernize teaching and create interest in the student community to make use of classroom teaching. The funds for higher education have become scarce and therefore constrained for the development.

The demand for higher education has led to a very fast growth of enrollment in Universities and Colleges. While enrollment in higher education was just 0.36 million in 1950-51, it is more than doubled during the first decade and was 0.89 million in 1960-61. In the subsequent 43 years, it improved to 9.2 million by the year 2005-06. In pre-independence period, very slow and rather tardy development of the educational system took place. To increase the educated manpower with a higher degree of skills and qualifications, the educational system was expanded.

3.1 College Libraries

The Universities should also seek the co-operation of the constituent and affiliated colleges in this regard. The University Grants Commission (UGC) and the Universities can offer special financial assistance to some selected Colleges for this purpose.

3.2 Digital Libraries

The digital libraries, the electronic and virtual libraries are also playing a vital role in the development. These libraries are occupied a privacy place in the dissemination of current and up-to-date information to needy clienteles. Among the above said libraries, the digital libraries are very useful to researchers, scientists and others also.

The objective of the present paper is to highlight the importance of the digital libraries, characteristics, functions and services of the digital libraries.

Meaning of Digital Libraries: A digital library is consisting of digital materials and services. The digital materials are items that are stored, processed and transformed via digital devices and networks.

Definitions: Digital Library project. University of California has defined as, "the digital library will be a collection of distributed information sources. Producers of information will make it available, and consumers will find it perhaps through the help of automated agents".

The Information Explosion is not confined to any particular subject and is also taking place in Social Sciences and Humanities and in every country. With Libraries facing manpower and monetary constraints, it is impossible to acquire every publisher's document under one roof and thus evolved the concept of resource sharing and networking. Since information can be digitized, the participant libraries are coming together to convert their holdings to electronic form and then putting them on the net. The technology for electronic transfer of information is developing rapidly; electronic publishing, electronic storage, processing and delivery of information including text and images are all feasible and operational. Further, presently most of the information is reproduced on paper for legibility of documents, which are reproduced, is poor and the transmission of the same to other users is difficult. Moreover, it requires a large amount of storage space. Since, there is a demand for information with a facility for searching tailor-made information at faster speed. Hence, digital library seems a suitable solution at the moment.

Digital Libraries do not mean libraries in the classical sense, but a network of multimedia systems, a typical digital library is a media server connected to high-speed networks. Unlike a conventional library where users are provided with physical materials from many sources, a digital library is a group of distributed repositories that users see as a single repository in digital form.

Characteristics of Digital Libraries: The transformation effects that digital technology brings into information system are as follows:

a) *Collections:* Digital library collections contain fixed, permanent documents. While current libraries have more dynamic collections, a digital library is quicker in handling of information.

b) *Work:* Digital libraries are to be used by individual working alone. There is work-oriented perspective focusing on a group of information analyst. Work being done and the documents and technologies that support it.

c) *Trans bordering Information:* Breaking the Physical boundaries of data transfers within and outside the countries. It is viewed that the support for communications and collaboration is as important as information seeking activities.

d) *Technologies:* The digitization requires certain technologies. They are basically grouped as:

   i) Computer technologies with input devices that collect and convert information into digital form. Such devices include keyboards: touch screens, voice recognition systems, flatbed scanner, reprography copy stand, high-resolution digital camera, image navigator software etc.

   ii) Storage technologies a variety of devices to store and retrieve information in digital form such as magnetic tapes cassettes, floppy disks, DAT Tape, and CD-Rom smart cards, etc.,

   iii) Processing technology creating the systems and applications software that is required for the performance of digital network.

   iv) Communication Technologies primarily to communicate information in digital form.

Functions of Digital Library

- Provide access to a very large information collection.
- Support multi-media content
- Network accessible
- Provide user-friendly interface.

- Unique referencing of digital objects.
- Support advanced search and retrieval
- Information available for a very long time.
- Also supports traditional library missions of collection development, organization access and preservation of information.
- Support editing, publishing, annotation and integration of information.
- Integrate personal, group, enterprise, public digital libraries.

Advantages of Digital Libraries:

Digital Libraries are essential to enable more people to create and use vast amounts of distributed information and to contribute to the quality and quality and quantity available via the web and the future access frameworks. The world wide web (www) offers a bounty of certain kinds of information to those willing to struggle through the repetitive searching.

- Provide universal accessibility
- Access to more information than is possible to physically acquire and maintain.
- Protecting rare books that are rapidly deteriorating due to over-use and poor storage conditions, the user can peruse them instantly.
- The e-books and journals provide keywords, subject and various other searches. provide multiple access and access through the campus LAN
- Facility for the down-loading and printing.
- A tool for preservation of heritage.
- Saving the cost and man-power required for publishing and bringing our new edition.
- One copy of the document could be viewed by any number of persons simultaneously. Saving space which is required for physical documents.

Services of Digital Libraries:

The purpose of digital library services is to enable the user to access the information required for knowledge enhancement or decision making. Digital media capabilities will additionally bring significant opportunities for the library to improve access and the value. It provides from its collections Digital Library services includes information about all the services, collections, digital sources, Library instruction sessions and services through the digital library, a library can enhance the services provided to users and also to reach new users. Digital collections and services will supplement rather than replace the traditional collection and services.

The specific services of digital library include providing remote access library include providing remote access library sources - both printed and non-printed, service delivers and generation information on library.

Suggestions: Today, the digital libraries are very essential to every personnel to update their knowledge. So that the following suggestions are made:

1. There is urgent need to digitize the library material of every college in Andhra Pradesh.
2. The steps should be taken to evolve the policies regarding digitization.
3. The Andhra Pradesh Higher Education Council (APHEC) should provide special budget for digitization of library material.

4. The college library personnel should be given the training in the digitization process.
5. There is very much need of co-operation from the College Principals to the Librarians.
6. Lastly, the student Community should also show interest in the utilization of digitized library material.

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Search Strategies for Accessing Health Science Databases

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Abstract: The widespread use of computers and the internet have made searching the medical literature easier and more accessible to most physicians, researchers and academicians. Online databases are growing at an alarming rate in health science subjects. The growing challenge of health science professionals is how to access and manage this ever increasing quantity of information. The planning process is crucial when literature searching and it is important to define the search topic, decide on the scope of the topic and think laterally about keywords to be used. Allowing plenty of time for the whole process is important as it can take much longer than anticipated. Much can be learnt every time a literature search is carried out; new keywords can be found, new ways of searching databases and the internet and new sources of information can be discovered.

Keywords: Health Science Databases, Literature Search, Search Strategies, Search Techniques

1. INTRODUCTION

With the information explosion, the retrieval of the relevant articles from bibliographic and full text databases can be difficult. Both health science researchers conducting systematic reviews and clinicians are confronted with the daunting task of searching for the best health science literature in online databases. Online databases are growing at an alarming rate. The growing challenge of health science professionals is how to access and manage this ever increasing quantity of information. Proliferation of health science literature emanating from many countries in various languages, increase in the number of health science professionals producing and using literature, and the need for rapid access to most recent literature have emphasized the need for a search strategy to facilitate the identification, selection and retrieving of health science literature.

2. LITERATURE SEARCH

Literature search is a systematic and thorough search of the various publications like books, journals, conference proceedings, theses and electronic databases in order to find literature related to the area of interest. Literature search is done to acquire a broad understanding of the topic, to find any existing research that has already been done in related areas, to ensure that no one else has already undertaken the piece of research that are intending to undertake. Literature search could be done by searching through the sources of information like books, journals, gray literature and electronic databases. Before starting the process of literature searching a number of steps need to taken as shown in Fig 2 .

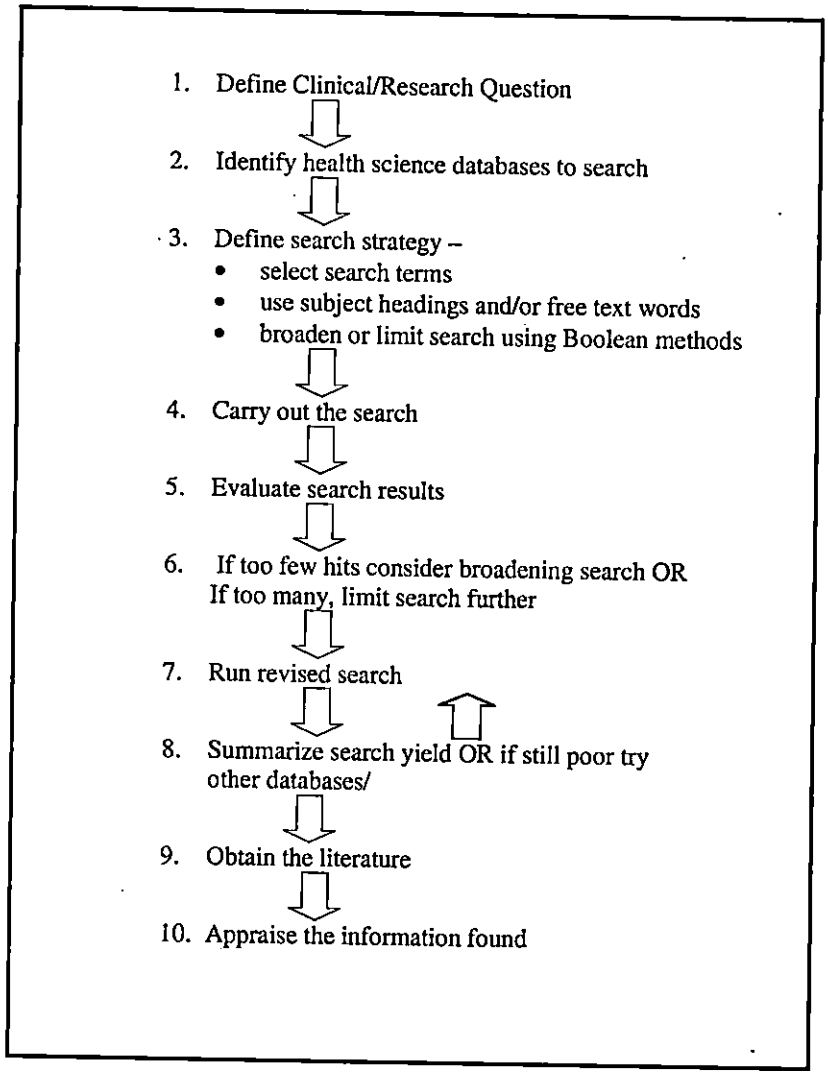


Fig. 1: Steps involved in Literature search

3. DEVELOPING A SEARCH STRATEGY

Before searching for any topic, a search strategy is to be developed. Search strategy is a plan that helps to look for the needed information. Search strategy includes formulating the research question, identifying the key concepts, determining alternative terms for these concepts, if needed, refining search to dates, study groups, etc., as appropriate. A well designed search strategy saves the time in the long run, allows to search for information in many different places and helps to find a larger amount of relevant information. A review of the literature is important for a research project because it enables to acquire an understanding of the topic, with its key issues, and an awareness of relevant research that has already been conducted. Exploring and selecting from the vast array of published information can be a time-consuming task, so it is important to know how to plan and carry out this work effectively. These will vary depending on database and advanced search techniques offered by the individual databases as they will not be consistent. Exploring and selecting from the vast array of published information can be a time-consuming task, so it is important to know how to plan and carry out literature search effectively.

3.1 Formulation of Research Question

The first step is to think about what information is needed need to answer the research question. This seems obvious, and might have done to a certain extent but a more systematic approach is required to retrieve the relevant literature. Breaking the question and listing of the major concepts/key words of the research question are to be done before starting the literature search. Special features of the databases like Medical Subject Headings (MeSH) in MEDLINE and Thesaurus terms in other databases are to be used. For each concept various synonyms are to be listed out.

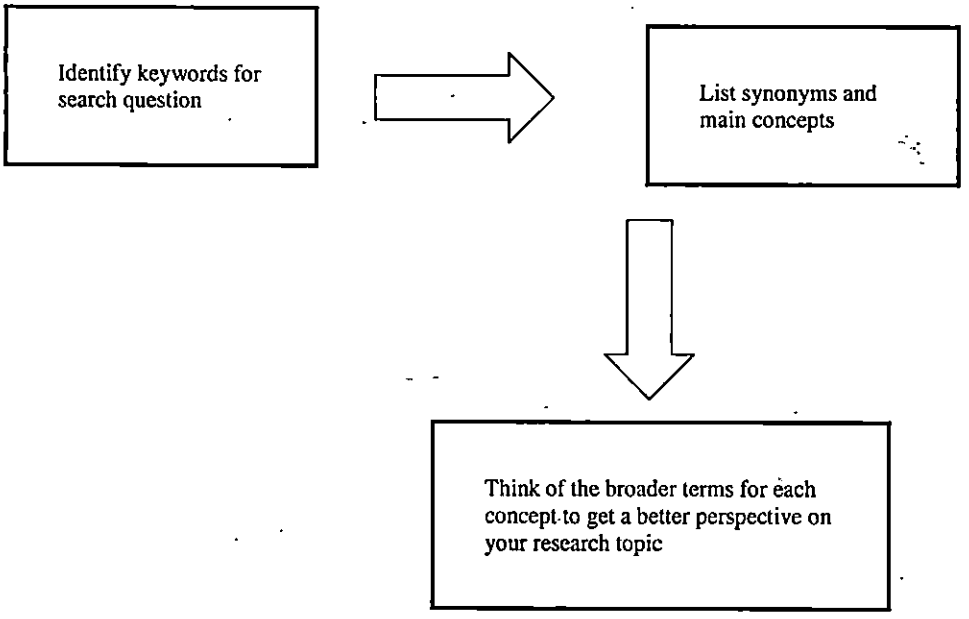


Fig. 2. Constructing the search statement

3.2 Identifying the Health Science Databases

Health science professionals are frequently overwhelmed by the amount of internet resources. The internet is increasingly becoming an important vehicle for accessing health science information with a variety of online resources for the health science professionals. Given the enormous amount of information on the web, finding the desired information becomes a problem. Many health science journals are now published online. There are different types of electronic databases available in the world today, including bibliographic databases, full text databases, statistical databases, image databases, and others. Bibliographic databases contain citations and/or abstracts (a short summary of the article) where as the full-text databases contain complete articles. Following are some of the important databases in health sciences subjects.

3.2.1 Access Medicine

A repository of medical knowledge, the AccessMedicine site provides access to the Clinical Library, comprising titles which have various interactive features, and also to the LANGE Educational Library, made up of electronic text reproductions of selected print medical education titles (non-interactive). Also includes sections entitled Guidelines, Quick Access Medicine, LANGE Case Files and Laboratory Values.

3.2.2 BioMed Central

BioMed Central, provides free access to original peer-reviewed biomedical research. Publications include full text journal articles, current reports, and meeting abstracts. Information about current controlled trials, as well as topics in biology and medicine are also included.

3.2.3 CINAHL Plus with Full Text

CINAHL Plus with Full Text is the world's most comprehensive Nursing and Allied Health research database, providing full text for more than 620 journals indexed in CINAHL. Of those, 305 are not found with full text in any version of Academic Search, Health Source or Nursing & Allied Health Collection. This authoritative file contains full text for many of the most used journals in the CINAHL index - with no embargo. The database also provides full text for 218 books/monographs. With full text coverage dating back to 1937, CINAHL Plus with Full Text is the definitive research tool for all areas of nursing and allied health literature.

3.2.4 Cochrane Library Online

It is the best single source of reliable evidence about the effects of health care. It contains all existing systematic reviews plus increasingly wider range of new updated reviews. It supports free text searching of all its contents, as well as keyword searching and the sophisticated software allows users to edit and save search strategies, download records and print easily.

3.2.5 EMBASE.com

EMBASE.com provides access to over 16 million validated biomedical and pharmacological bibliographic records from EMBASE and MEDLINE (produced by the U.S. National Library of Medicine). The database can be searched by field, drug, disease and article. Journal titles can also be browsed.

3.2.6 Faculty of 1000 Medicine

Faculty of 1000 Medicine is a scientific literature awareness tool. This online research service comprehensively and systematically highlights and evaluates the most interesting papers published in medicine, based on the recommendations of 2,500 leading international researchers and clinicians. Faculty members submit short evaluations of 2-3 interesting articles that they have read in the previous month, providing an article rating. Evaluations are systematically organised according to subject keywords and are cross-linked to make it easy.

3.2.7 IDIS/Web (Iowa Drug Information Service)

IDIS/Web is a database of index records to articles about drugs and drug therapy in humans taken from over 200 leading medical and pharmaceutical journals. The complete article is also available online (1997 through the current month). This database is designed by Division of Drug Information Service (DDIS), The University of Iowa, USA to retrieve specific information concerning a drug and/ or drug treatment of a disease state. Authoritative publications have been selected to provide broad coverage of both general and specialty areas of pharmacy and medicine.

3.2.8 MD Consult

MD Consult is one of the most efficient tools available to physicians today, putting a breadth of. highly respected, current clinical resources at their fingertips. MD Consult brings the leading medical resources together into one integrated online service to help physicians efficiently find answers to

pressing clinical questions and make better treatment decisions. A service of Elsevier Science Publisher, MD Consult operates a family of electronic information resources that meet the clinical content needs of physicians and other health care professionals. The site is designed to meet the exacting needs of clinical practitioners, providing practical and time-saving features that users could quickly access the precise information they need. MD Consult core collection contains 53 journals and 35 Clinics of North America (full text access from 1996 onwards) and 51 reference books. Apart from journals and books, it contains latest news in the field of Medicine, 30,000 drug databases, more than 1000 practice guidelines, and 10,000 patient handouts as well.

3.2.9 POPLINE

POPLINE (Population information online), the world's largest database on reproductive health, provides more than 350,000 citations with abstracts to scientific articles, reports, books, and unpublished reports in the field of population, family planning, and related health issues. POPLINE has numerous special features including links to free, full text documents, the ability to limit the search to peer-reviewed journal articles and many abstracts in French and Spanish.

3.2.10 ProQuest Medical Library

This database contains full text articles from more than 850 health science journals, Annual Reviews and back volumes. Abstracts and indexing from MEDLINE database are also covered in this database. The journals cover all major health care specialities including Pharmacology, Neurology, Cardiology, Physical Therapy, Dentistry, Nursing and others. Topic wise and journal wise search can be made using this database.

3.2.11 PubMed

PubMed developed by the National Library of Medicine (NLM) is designed to provide access to citations from biomedical literature. It provides access & links to the other molecular biology resources. It provides access to bibliographic information that includes MEDLINE. MEDLINE is a bibliographical database covering the fields of medicine, nursing, dentistry and preclinical sciences. It contains all citations published in Index Medicus. Articles from more than 4800 biomedical journals in 40 languages since 1950 are covered in MEDLINE. English abstracts are available for the majority of citations from 1975.

3.2.12 SciFinder Scholar

SciFinder Scholar gives access to CAS (Chemical Abstracts Service) Registry, world's largest collection of substance database with over 92 million organic, inorganic, peptides, nucleotides and other substances with molecular structures, sequence codes and referring articles and patents. In addition, there are 1 billion experimental and predicted properties to use. SciFinder Scholar has over 27 million references since 1907. Total number of journals covered in this span is over 70,000, major conferences, and patents from 50 countries. SciFinder Scholar is updated daily. SciFinder Scholar covers all aspects of Chemistry, Biochemistry, Biotechnology and Chemical Engineering and additional coverage to Medicine, Pharmacology, Phytochemistry, Enzymes, Genetics, Natural Products, Extractions, Synthesis, Reaction Kinetics, Spectral, Crystallography, Polymers, Hormones, Immunology, Toxicity and many more.

3.2.13 ScienceDirect

ScienceDirect contains over 25% of the world's science, technology and medicine full text and bibliographic information. Apart from online eBooks, reference works, handbooks and book series,

ScienceDirect offers a rich journal collection of over 2,000 titles. In addition, the backfiles program offers the ability to search a historical archive of over 6.75 million articles directly from desktop, back to Volume 1, Issue 1. The collections contain 4 million articles prior to 1995, and 2.75 million articles from after 1994.

3.2.14 Scirus

A comprehensive science-specific search engine which returns results from the web and the journal sources like ScienceDirect, MEDLINE on BioMedNet, Beilstein on ChemWeb, Neuroscion, BioMed Central, US Patent Office, E-Print ArXiv, Chemistry PrePrint Server, Mathematics PrePrint Server, CogPrints and NASA. A user could limit an advanced search to a subject area, a particular source or a document type, such as conferences, patents, journal articles, preprints, web sites or books. Search results can be ranked according to relevance, or sorted by date.

3.2.15 Scopus

It is an abstracting and indexing database of scientific, technical, medical and social science literature. It includes peer-reviewed titles from international publishers, open access journals, conference proceedings, trade publications, patent records and quality web sources. Seamless links to full text sources where the library holds a subscription.

3.2.16 SPORT Discus with Full Text

With over 230 full text titles, SPORTDiscus with Full Text is a bibliographic and full text database covering both serial and monographic literature on sports, physical fitness, exercise, sports medicine, sports science, physical education, kinesiology, coaching, training, sport administration, officiating, sport law and legislation, disabled athletes, sports facility design and management, intramural and school sports, doping, health, health education, biomechanics, movement science, injury prevention, rehabilitation, physical therapy, nutrition, exercise physiology, recreation, leisure studies, tourism, allied health, occupational health and therapy. With full bibliographic coverage, this database includes more than 750,000 records with journal and monograph coverage going back to 1800; over 20,000 dissertations and theses and reference to articles in 60 different languages.

3.3. Boolean Operators

Searching for one concept at a time and only then combining the sets will allow the greatest flexibility in searching. Search concepts could be combined using Boolean operators AND, OR, NOT.

AND operator is to be used to retrieve a set in which each citation contains all the search terms. This operator places no condition on where the terms are found in relation to one another; the terms simply have to appear somewhere in the same citation. Eg. cold AND fever.

OR operator is to be to retrieve documents that contain at least one of the specified search terms. Eg. cold OR fever.

NOT operator is to be used to exclude the retrieval of terms from the search. Care is to be taken when using this operator as relevant articles may be eliminated. Eg. Cold NOT children.

3.4 Phrase Searching

The search term is to be used with double quotes (" ") in phrase searching to avoid irrelevant articles. Eg. Single cell is to be entered as "single cell".

3.5 Stop Words

Common words such as during, a, latter, presently, though, about, each, previously, through, above etc. should not be used while searching for literature using the databases.

3.6 Medical Subject Headings

MeSH is the acronym for "Medical Subjects Headings". MeSH is the authority list of the vocabulary terms used for subject analysis of biomedical literature at NLM. MeSH vocabulary is used for indexing journal articles for *Index Medicus* and MEDLINE. The MeSH controlled vocabulary is a distinctive feature of MEDLINE. It imposes uniformity and consistency to the indexing of biomedical literature. Eg. If the term renal transplant is searched, PubMed will find a match for this in the MeSH translation table. Renal transplant is a synonym for the MeSH term, kidney transplantation. PubMed will search using the MeSH term as well as the term originally entered.

3.7 Setting Limitations

One of the ways users can limit their retrieval to MEDLINE citations in PubMed is by selecting MEDLINE from the Subsets pull-down menu on the Limits screen. Limits also allow one to restrict the search to articles published in a specific language and to specific types of articles such as review articles. Limiting retrieval to a specific subset of citations within PubMed, such as MEDLINE, AIDS-related citations or nursing journals is also possible. User may limit his retrieval only to citations that contain abstracts, age group, gender wise etc. Peripheral concepts are to be eliminated and only the most important concepts are to be searched. Additional search terms are required to be identified by examining the subject headings assigned in one article. Search is to be revised using those subject headings to find additional relevant articles. titles and abstracts of relevant articles are to be examined for additional text word terms.

3.8 Synonyms, Truncation

Synonyms or related terms to search are to be added using "OR". Truncation could be used. An astrick at the end of the term to search for all terms that begin with that word is to be placed. Eg. Surg* will find all terms with the letters surg i.e., surgery, surgeon and surgical. Truncation should not be done in case of thesaurus terms (subject headings). Fewer limits or no limits to search could be applied in case the search is required to be broadened.

4. CONDUCTING THE SEARCHES AND EVALUATION OF SEARCH RESULTS

Literature search is to be conducted by using appropriate search strategies after selecting the required databases. A review of the literature is important for a research project because it enables to acquire an understanding of the topic, with its key issues, and an awareness of relevant research that has already been conducted. Value of the materials found is to be assessed by using following criteria. These criteria are to be used for assessing the relevance and usefulness of the material retrieved.

- Are they relevant to discipline, subject area and topic?
- Is the format and level of the material appropriate for the assignment?
- Are the author(s) credible?
- Is the material from a reputable source i.e. a peer reviewed journal?
- Does the material show any bias or express a viewpoint that is not backed up?
- Is there proof for all the facts presented in the material?

- Does the material cover all areas that are needed e.g. does it cover the right geographic region or a useful timescale?
- Is the material of an appropriate age e.g. is it too old to still be valid or too new to be backed up with proper research?

Search results obtained by conducting literature search using databases are to be evaluated based on research question. If search results are satisfactory the same concepts are to be utilized to expand and build upon search in other databases. Basic literature searching skills are transferable from one database to another, and the basic principles are the same. It is the use of thesauri indexing / controlled vocabulary that may differ from database to database. If search results are not satisfactory, use of broader subject term and appropriate limiters could be considered since by applying too restrictive limits like date range, age group, study-design etc. useful search results might have excluded.

5. CONCLUSION

Application of the search strategy techniques are playing very important role in retrieving the relevant literature from health science databases. While most of the databases define search criteria in very specific ways, not all function identically. The Health science professionals must keep pace with their abilities to retrieve the health science literature from the databases. The process of retrieving the information needed for research can be quite complex but adopting a methodical, structured approach removes much of the difficulty. Understanding how to perform sophisticated searches of online databases will greatly increase the chances of finding what is required. Knowledge of search strategy is the key for fast and efficient use of the health science databases. Appropriate use of synonyms, effective use of thesauri/controlled vocabulary, keyword index, truncation, limiting searches by field, taking into account alternative spellings, using Boolean operators effectively and use of full range of appropriate search techniques in literature searching will facilitate the identification, selection and retrieving of health science literature from the databases. Whether bibliographic databases, subject gateways, search engines or other internet resources, search strategy is to be followed. By planning the search, the health science databases could be used more effectively and better results could be obtained.

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Setting up Digital Archives at Centre for Media and Cultural Studies: Challenges and Possibilities

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Abstract: Today Digital archives deal with various types of information, in various formats and with different contents. Each digital archive is set up according to its organizational structure, types of users and their varied information needs. This paper is a case study of the process to establish the digital archive at CMCS, TISS. Selection of hardware and software, digital preservation, user needs and satisfaction, and future plans are discussed in detail. The job of archivist is challenging in terms of procurement of new digital assets, preservation of the old and management of the entire archive material for optimum use. Thus, the setting up of the digital archives of A-V assets needs strategies different from that of the book library.

1. INTRODUCTION TO DIGITAL ARCHIVE

Digital archive is a documented information system employing information architecture configured to assure trustworthiness and long-term retention of digital assets. In simple words a digital archive refers to a collection of e-records, and also refers to the location in which these records are kept. It is a repository that stores one or more collections of digital information objects with the intention of providing long-term access to the information.

Digital information is fragile in ways that differ from traditional technologies such as paper or microfilm. It is more easily corrupted or altered without recognition. Digital storage media have shorter life spans, and digital information requires access technologies that are changing at an ever increasing pace.

Advancements of information technology made it possible to archive different kinds of knowledge in digital formats.

Because of the speed of the technological advances, the timeframe in which archiving must be considered becomes much shorter. Archives have their own very particular features which are explicitly recognized in their description. They work as a medium between preservation, conservation and exchange of information to all.

The archives provide us a quick and efficient way to locate the information searched and to identify the related subjects. Technological innovations have changed scenario of archive to digital archive.

Books, documents, journals, various files (text to audio-video), graphic files, web pages etc. all get digitally archived by creating different databases and metadata information related to them.

From hardware to software there is a wide range available to select the types and formats as per the nature of digital archives. The information lifecycle in these archives is completely digitized, from storage retrieval to delivery to serve the end user.

Traditionally librarians are familiar with print archives such as newspaper clippings, footage information, maps, manuscripts, etc. Digital archives contain documents either converted from print media into digital documents as well as archives of other types of material such as audio visual material. Various types are discussed in the next section of the paper.

2. TYPES OF ARCHIVES

There are various types of archives found based on content and type of information. Commonly found types of archives:

Print archives: these include newspaper clippings, photographs, films, footage information, audio-visual information, advertisement archives. For e.g. Mag-India, various newspaper archives, television archives, film archives, photograph archives (categorized into print and media archives).

Internet based archives: journals and periodicals, scholarly articles, research papers, scanned documents. Various subscribed databases fall under this category of archive for e.g. Ebsco, Sage publications, Emerald etc.

Corporate archives: consist of archive information related to a particular group of companies. For e.g. Tata archives, Reliance archives, Godrej archives, Aditya Birla archives etc.

The information in these kinds of archives can be found in various types of formats. In media and print archives the information is mostly found in formats such as JPEG, MPEG, TIFF, GIFF, WMV and MP3. In internet based archives information is usually found in textual format such as PDF, and HTML, while in corporate archives the format of information is in PPT, PDF, JPEG, TIFF, GIFF etc.

3. DIGITAL ARCHIVE AT CMCS, TISS

The Centre for Media and Cultural Studies, (CMCS) is an independent centre of Tata Institute of Social Sciences, engaged in media teaching, production, research and dissemination.

A unique feature of the Centre is the close linkage between the technical and academic areas of its work. The work of the Centre straddles both realms, thus facilitating a synergy between research, teaching and production, all of which are informed by a keen sense of connection with local subaltern cultures of resistance and invention.

Production is the important component of the Center's work. It has to its credit, twenty one awards at national and international film festivals. The Centre is also involved in media and cultural studies research.

The Centre has established a Digital Archive of films, video footage and photographs. Faculty and students of the Institute regularly access this collection. This database is also used by other agencies, visiting academics, activists and researchers.

Digital archive in CMCS, TISS falls under the media and print archives. The archive is currently in process of digitizing of its collection. The next part of the paper discusses the Digital archive at CMCS, TISS, including current status, types of material, challenges faced in establishing the digital archives and strategies adopted for setting up these digital archives.

4. COLLECTION IN DIGITAL ARCHIVE IN CMCS, TISS

CMCS, TISS Digital Archive comprises of unique collections of footage of its home productions, dating back to 1986.

In simple words, footage is the raw, unedited material as it had been originally recorded by the video camera, which usually must be edited to create a motion picture, video clip, television show or similar completed work.

Generally, footage is referred to as all sequences used in films and video editing, such as special effects, digitized clips, recorder images and archive material.

The archive is also a repository of documentaries, short and experimental films, various photographs of TISS events as well as transparencies of old projects done by CMCS. The above mentioned collection makes the CMCS Digital Archive more vital and relevant.

The total strength of our digital archive is around 1400 records which include: -

- Documentaries on subject areas such as child development, women and gender issues, people's movements etc:
- English classics, short and experimental films
- Digitized transparencies of projects such as Marianad, Shahade, Hemalkasa, Dabbawallas etc.
- Scanned images of the photographs of TISS and TISS events
- Hours of footage of the Center's video projects, on analogue and digital video media.

The entire project of Digital Archiving at CMCS, TISS can be discussed in two phases:

A. Digitization and Maintenance of Database: evaluation of current status of digital archive material, planning and decision on number of issues required for digitization.

B. Future plans: Since this archive is in establishing stage, definitely there are plans for future.

4.1 Planning of digitization, creation and maintenance of database

Digitization facilitates research and study, allowing quick comparison, searching and editing within he digital object. In their digital form AV content can be more effectively accessed by the users than possible by analog collection.

By digitizing analog material the content from a fragile storage and delivery format get preserved in digital form, and make it possible for the content to be copied without loss.

The challenge here is to produce high quality digital version.

The preservation and archiving process is made more efficient when attention is paid to issues of consistency, formats, standardization and metadata description in the very first stage of digitization.

Thus, repository creation, maintaining of database and metadata for the digital archive has been quite challenging task.

Following are the factors which came up and were resolved during planning and archiving process:

- **Decision on the type of material to be digitized:**

A first stage is of identifying what kind of material is to be digitized. Since CMCS, TISS archives have various types of Audio-Visual (AV) collection, prioritizing of what is to be transferred first is being done. This has been decided on the basis of the content of information, quality of format and the conditions of preservation. In few cases quality and urgency for digitization have been considered. It involves an assessment and sorting stage, which determines what action, should be taken for different kinds of AV collection of CMCS.

- **Transfer and type of format for digitizing material:**

After identification, assessment and sorting, it was equally important to decide the format on which the digital material will be transferred. The two major factors that affect the cost of transferring items into a form that can be digitally archived are degradation (e.g. chemical decay, or wear and tear) and technical obsolescence (media players, spare parts and skilled operators are not available).

There are no hard and fast rules for calculating life expectancy due to decay (e.g. tape conditions depend on manufacturers, production batch, storage conditions, frequency of handling). Other time dependent factors such as technical obsolescence and inflation are modeled as affecting the cost of transfer or repair. It is also very time consuming to quality check the digital audio against the original analog material.

There are several formats are used to save the look and feel of the image or actual material. TIFF, PDF, or HTML are most commonly used image files. TIFF is the most commonly for organizations that are involved in any way with the conversion of paper back files.HTML/SGML is used by many large publishers after years of converting publication system from proprietary formats to SGML while PDF is the mostly used for electronic documents. It is used both for formal publications and grey literature.

At CMCS Digital Archive, photographs and slides are being scanned at 600 resolutions and are saved on TIFF file format. TIFF gives the best resolution and it is a actual delivery format that the user sees.

Umatic tape to DVCAM: The Centre has decided to transfer the masters of earlier TISS home productions from analog Umatic to DVCAM, which is a digital format tape, better than Umatic in resolution quality. DVCAM is a superior format to Mini DV format. It gives better storage and is good for color reproduction.

Umatic tape to Mini DV: Decision has been taken to transfer footage of earlier TISS productions. Mini DVs are economical and easy to use.

CMCS will be using HDV, a new format for the upcoming projects for shooting and editing purpose. The main advantage of HDV is it has a cinema scope feature, with a 9:16 aspect ratio.

All these tape formats are easy to use and easily available in the market.

VHS to DVD: Digitizing documentaries, short and experimental films. DVDs are economical, durable and easy to use format especially for documentaries and films.

- **Hardware selection:**

Digital audio can be created either by recording directly to the digital sound card or by using an external device to transfer audio-video material. High quality external devices produce superior results to sound cards.

Different sampling rates have an important effect on the end result. Current technology allows the audio digitization at the so called "DVD standard". This should be recommended as the preferred audio digitization standard for most organization.

Preservation of the master at the highest possible quality should be taken into account.

In CMCS digital archive decision has been taken on standard formats where the material will be transferred and digitized such as –

HDV 1080I- Digital HD Video Cassette recorder HVR 150:

In this HDV recorder of Sony you need to change the settings at the initial level for HDV, DV, Mini DV and DVCAM.

- **HP Scanjet G4050 Scanner**:

It has a multi-scanning option. So, for scanning of slides/ negatives and photographs the same is being used in the centre.

It allows scanning all types of negatives from 35 mm to 120mm and various sizes of photographs up to A4 size.

This scanner also has option of saving scanned document in PDF format along with other common file format such as TIFF, JPEG, GIF, and HTML.

- **Onida DVR 8637, DVD Converter:**

VHS are converted to DVDs with this converter.

It gives us high quality video files such as MPEG2. DVD's of Sony of 4 G.B. are used for this transfer.

- **Evaluation of various software and selection:**

Developing or selecting software is another significant aspect that needs detailing for managing digital archive database. The crucial decision has to be made here, was whether to go for product based software available in the market or to develop software as per our requirements.

Before finalizing following aspects has been dealt with:

a) Analysis of users, usage and access to digital archive:

CMCS center conducts MA course in Media therefore the media students, faculty members are the potential users of our digital archive. Apart from these students the faculties, researchers of other centers in TISS will also be active users of our collection.

It was decided to give lending based access for selective collection. This needed extension of circulation, searching of query based information facility to them.

b) Decision on product based or customized software: —

Analyzing the user needs, circulation queries, reference searching, decision was taken to go for Windows based software SLIM 21 (System for Library and Information Management).

It was decided to go for product based software, which can be customized as per our specific requirements because CMCS digital archive will also be acting as a repository of A-V collection.

Requirements were listed out as per the repositories and accessibility point of view. After assessment of other archive's databases, fields in databases and consultation with the software vendors, customization has been undertaken.

- **Metadata and standards for metadata:**

Standards for creating digital objects and metadata description, which specially address archiving issues, are being developed at the organization and discipline levels. Cataloguing in the form of metadata supports organization, access and restoring of information. Cataloguing and identification practices are often related to what is being archived and resources available for managing the archive.

Standards for cataloging, persistency and unique identification are important in order to make the material known to the archive administration.

A variety of metadata formats, content rules and identification schemes are currently in use, with an emphasis on crosswalks to support interoperability while standardizing as much as possible.

Issues of storage and preservation (maintaining the look and feel of the content) are closely linked to the continuous development of new technologies and standardizations.

By considering the cataloguing details for a typical digital AV media archive, fields have been mapped and customized for the data entry in SLIM21.

- **Storage and weeding out of digitized and analog material:**

Since, the migration has been done from old technology to new technology, changing storage media suitable to latest technology cannot be ignored in archival setup.

There is always concern about the loss of data or problems with the quality, when the transfer is made. In CMCS Digital Archive preservation and the quality are seen at the highest possible level. Therefore after testing the accuracy about the quality of recording and the resolution of the digitized information and formats, weeding out of the old formats is in process such as U-matic, VHS etc.

The centre have fully air conditioned storage space along with the dehumidifiers to maintain the particular degree of temperature for digitized formats and AV material.

The interior of the digital archive has also been planned by keeping in view the storage space needed in future.

- **Access to resources and collection:**

At present traditional access has been adopted and provision of information is only by means of documents or information objects i.e. catalogue or bibliographic databases. Based on this a copy is being delivered directly to the user.

Because the archive is in a setting up stage close access to the collection and resources is restricted to TISS community.

Barcode printer and scanner have been installed mainly for easy stock taking and also for basic circulation.

Intranet access to digital archive collection is available to all TISS members.

- **IPR/Copyright issues: -**

IPR issues are one of the important aspects in the acquisition process. The approaches to IPR issues are particularly based on the type of organization doing the archiving. IPR also differs from country to country. In many countries the law is not caught up with changing digital scenario.

In many of the corporate archives where there is a close tie between the center and the owner or funding source. So there is little question about the IPR related to acquisitions.

In CMCS digital archives, acquisitions are mainly done for documentaries and short films where policy has been decided to acquire either directly from the producer or from authorized companies, NGO's, vendors, organizations who have rights to sale.

To avoid the violation of IPR and copyright issues, our centre is planning to put up precautionary note on each of the AV material which has been digitized.

4.2 Future plans for Digital Archive CMCS, TISS

It has already been mentioned that center's digital archive is in the establishing phase. After successful digitization and transfer entire AV material, the digital archive intends to provide information services to users.

Internet based access:

CMCS Digital Archive is the only media archive in Social Sciences, hence internet based access is also required. It will facilitate the users to retrieve the information 24/7 and optimum utilization of archive's resources

Plans have already been put up and approved and process has already begun.

Collection development:

In the collection development policy it has been decided to acquire various documentaries, short and experimental films on social issues, women empowerment, child development, healthcare management, environmental awareness etc.

Rare collection of English classics are been acquired from technical and courseware point of view for the students of MA in Media.

The archival center also has a valuable collection of footage information on various documentaries produced by CMCS, TISS and creation of database for this footage information is in process, soon access will be given to the CMCS center, faculty and students.

Uploading the latest photographs of the events in TISS:

CMCS Digital archive is in the planning phase for uploading and later archiving all the recent event photographs taken by CMCS on Intranet server for easy accessibility to all.

Along with this it is also being planned to upload presentations, seminar and conference papers presented by CMCS faculties and guest lecturers and archival of the same in future.

Providing membership to other than TISS:

Many requests have been received from other college students of Media and related Courses, for borrowing and viewing of documentaries and photographs and hence, there are plans to extend membership to them.

5. ROLE OF ARCHIVIST: CHALLENGES AHEAD

The digital storage media have shorter life spans and digital information requires access technologies that are changing at an ever increasing pace.

So today's archivists cease to act in the traditional path; they are now the information specialists drawing upon a wide array of automated and analytical techniques.

An Archivist also has to deal with various issues such as:-

- Storage media instability and deterioration
- Technology obsolescence and incompatibility (at the level of: hardware, system software, application software, data and file formats, storage media readers and drivers)
- Lack of metadata which results in the failure to locate information, the inability to render and read the information.
- Lack of clarity in the assigned responsibilities and resources for long-term preservation.
- Need to keep pace with fast changing technology.
- The archivists are not just the passive recipients of documents but they have a more active role in the creation, distribution and preservation of the information.
- There is a need to work out strategies for self improvement, opportunities for on job training and growth through professional interaction. They must now look to information managers from the computer science tradition to support the development of a system of stewardship in the new digital environment.
- There is need to identify new best practices that satisfy the requirements and are practical for the various stake holders groups involved.

- Apart from management and documentation of information the archivist also become conversant with new EDP and Telecommunication technologies.
- He/she must also establish close working relationship with other technical specialists within the parent organization. They have to keep updated and trained themselves with new equipments, information technologies such as software, hardware, networking and telecommunications.
- They also have to enhance their capacities and skills to deal with the new internet based accessibility to digital resources.

Last but not the least; an archivist must also broaden contacts to those in related areas of archives and information services industry. By broadening professional contacts within and outside archival associations can explore new opportunities for the exercise of our skill in respective workplaces which will strengthen the grasp of the technology of information science; archivists will position themselves for new responsibilities.

6. CONCLUSION

This is just an attempt to explain how a media archive especially in the academic sector is shaping up. These media archives face many problems when planning the long term preservation of their assets. These problems are not only unique to media archives but it is applicable to any large archives when they are migrating to new technologies i.e. analog to digital. While there are still many issues to be kept for open discussions in the field of digital media archives such as access mechanism, hardware availability and non availability of suitable software's as per the typical requirements of media archives. Apart from these technological issues more information must be shared concerning rights management and security from other archivists. This also suggests how modern archivists need to develop our networks, exchange and sharing of information and of course up gradation of our technical skills.

Thus, more collaborative efforts has to be made by librarians, archivist, information officers, information managers to develop new traditions, systems for ensuring the preservation and continued access to new form of digital possessions.

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Use of Digital Resources and Services in Dental Science College Libraries: A Study

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Abstract: Digital library resources and services are the prestigious issue of modern library concepts. Digital libraries play a vital role in all subjects of study. Access to digital resources and services has become an important and commonly accepted tool for researchers, faculty members and students. The aim of the present study is designed to investigate the patterns of use digital resources and services by the faculty members and students in dental science college libraries. It covers purpose of using digital resources, extent of user satisfaction, use of CD/DVD's, success rate of finding information in internet etc. A well structured questionnaire was distributed among the 217 faculty members and PG students of three dental colleges and 174 filled questionnaires were received at the response rate of 80.72 per cent. 64.94% of users visit everyday and spent 2-4 hours in the library. Studying current events and use of online databases were the main purposes of using digital resources. E-journals remain the most used digital resources and the success rate of searching information in internet and CD's is between 75-99 per cent

Key Words: digital resources, digital services, dental college libraries.

1. INTRODUCTION

The rapid advances in computer and telecommunication technologies has led to the emergence of global village, which has resulted in production of huge amount of information in electronic form all over the world. As a result of increase in the production of electronic information, users are in a better position of having up-to-date information to fulfill their needs. Such information will be available on CD-ROMs, DVDs, Magnetic tapes, USB drive, web etc. The emergence of electronic publishing has changed the role of librarian from custodian of document to information provider and information intermediary. As a result, libraries are facing new challenges, new competitors, new demands, new expectations and a variety of information services from users tailored to their wants and needs. Libraries are reconsolidating their positions, redesigning their services, and information products, incorporating new technologies, upgrading information resources, training people, changing information objects, modes of communication and information delivery in order to add value to their services, and to satisfy the changing information needs of user community.

Health Sciences, like any other science, is undergoing rapid changes. Health research is increasingly recognized as one of the driving forces behind health care development. Health Care System is considered as one of the priority areas in strategic plans for development in the country. An effective Health Care System will have its policies and programmes. To formulate polices and programmes, the R&D effort on these areas needs to be strengthened and to find out new ways for disseminating new knowledge. The results of R&D are visible only in the form of literary production. The literature is scattered in different physical forms and also being distributed using various modes of communication ranging from manuscript to electronic media.

2. PREVIOUS STUDIES

Here, an attempt has been made to cover number of related works and highlight briefly the objectives and findings of the studies relevant to the present work.

The study conducted by Hussain and Raza (2000)[1] has discussed different types of OPACs deals with the document searching through access point as author, title, subject, class number, key word etc. The combination search provided opportunity for a user to form search strategies, using Boolean logic, this Boolean logic operators indicate the relationship among the terms in search strategy. Hiller (2001)[2] studied the user needs, satisfaction and library performance at the University of Washington Libraries. The survey revealed a great change among users in the use of library resources and services. All the users had greater focus on collection and its access than on other matters. Kanaujia and Satyanarayana (2003)[3] conducted a study of the Science & Technology community of Lucknow city to assess the level of awareness and demand of web based learning environment among Science & Technology information seekers. The major findings of the study revealed that majority of them used Internet for consulting technical reports regularly followed by e-journals, online databases. Naushad and Hasan (2003)[4] has conducted a survey of the use of electronic information service by the users of IIT library, New Delhi. The paper also examines the utilization and satisfaction level of users about internet, CD-ROM databases and other services provided by the library. Finally it highlights the suggestions made by the users for the further improvement of digital services at IIT library Delhi. Sangam and Hadimani (2004)[5] have analysis of OPAC discuss the use of OPAC by the research scholars in Karnataka University, Dharwad. It outlines the benefits derived by the research scholars from OPAC. Further, states the different approaches to OPAC by the research Scholars. Vijay Kumar & Others (2005)[6] conducted a study on Web based library services in research libraries of Karnataka. This study suggests that most of research libraries are following hybrid culture i.e. both manual & electronic for providing services. Majority of the aerospace research libraries effectively using web technology to provide library services compared to biological and health science libraries. But all selected academic libraries provide web based library services compared to aerospace and biological & health science libraries. Renwick (2005)[7] conducted a study with an objective to determine faculty's knowledge of electronic resources, use of electronic resources available at the Medical Sciences Library. Overall, it was found that faculty had high awareness of the electronic resources made available by the MSL but low use of MSL-specific resources supporting the suggested problem of underutilization. Many respondents felt that e-resources were important, and expressed a need for training. Over 60% felt that a workshop with a hands-on component was the preferred format for training. It was recommended that there be greater promotion of the library's e-resources. B.D Kumbar & Others (2006)[8] have made one on use of UGC-Infonet consortium by the faculty and research scholars of Dept. of chemistry in Karnataka University Dharwad. The present study has clearly indicated that, the electronic resources are highly useful for research and academic community in the present environment. The study clearly indicates that e-journals are most widely used electronic resources by the chemists. They also felt that regular training programme is necessary to use effectively the INFONET programme. The study conducted by Lohar, M.S (2006)[9] on use of electronic resources in the BIET college, Davanagere, reveals that most of the user communities are using electronic resource for their academic purpose. The speed of accessibility and mode of dissemination of information according to the user's need make the faculty members to use electronic resources more frequently. Kannappanavar, B U and Chidanada Swamy (2008)[10] have discussed the university agricultural science libraries in Karnataka state. Here they explained about on line information resource concerning agricultural science, like virtual libraries e-journals, databases of agriculture science, online electronic libraries and its objectives etc. Finally, they discussed about important digital information systems like AGRIS, AGLINET, and CRIS etc which are famous on international on line network level.

3. OBJECTIVES OF THE STUDY

1. To identify the different types of digital resources and services available in the study area.
2. To study the purpose of using digital resources and services by the users.
3. To know the extent of use of digital resources and services in Dental science college libraries.
4. To assess the users opinion towards digital resources and services and other physical facilities.
5. To suggest suitable measures to improve the digital resources and services for the benefit of faculty members and students.

4. NEED FOR THE PRESENT STUDY

We are living in the electronic information era which is characterized by the availability of information in electronic form. Digital library and services through electronic form is a prestigious issue of modern library concepts. Digital libraries play a vital role in the field of education. Health Science education is no exception to this. The information resources available in electronic forms in health science are very large. The subject dental Science is very vast and multidisciplinary which covers the subjects like Dental Anatomy, Physiology, Oral Pathology, Pharmacology, Orthodontics, Oral Surgery, Conservative Dentistry, Pedodontics, Oral Medicine and Radiology, Community Dentistry and Periodontology, etc. With the exponential growth of information in digital forms and its services today, users must be in a position to recognize these resources and services in their field of study. Electronic access to digital resources and services has become an important and commonly accepted tool for researchers, faculty and students. Hence, it is a matter of concern for the present libraries to have such collection to meet the information needs of their clients. Therefore, it is interest for us to study the digital resources and services in dental science college libraries.

5. METHODOLOGY

The study used questionnaire-based survey method, as many similar studies conducted earlier, have also used this method for data collection. The study population consisted of full-time faculty members and PG students of Dental Sciences. A separate questionnaire was designed both for librarian and users under study. In order to save time and ensure better response rate, the questionnaires were distributed to the staff members and students personally and approached them to respond all the questions to best of their knowledge and collected the same with duly filled. A total of 217 questionnaires distributed to both faculty members and PG students and 174 filled questionnaires were received, showing an overall response rate of 80.72 percent.

Table 1. Total strength of faculty members and PG students

Name of the College	*Total No. of Faculty*	*Total No. of PG Students*
Bapuji Dental College & Hospital (BDCH)	62	141
College of Dental Sciences (CODS)	56	141
SJM Dental College & Hospital (SJMDCH)	30	Nil
Total	**148**	**282**

Table 2. Response rate of users

	Total Dental college user Population	*No. of questionnaire Distributed*	*Percentage of response received*
Faculty Members	148	74 (50 %)	61 (82.43 %)
PG Students	282	143 (50.70 %)	113 (79.02 %)
Total	430	217 (50.35 %)	174 (80.72 %)

Number given in parenthesis represents the percentage

6. USE OF DIGITAL RESOURCES AND SERVICES

Use of digital resources is a major concern of all types of libraries. Health science libraries are not exception to this. Hence there is a need of greater promotion of use of digital resources by the libraries.

6.1 Types of resources available in the library

The following table shows the total number of digital and non-digital resources available in all the three colleges in their respective libraries. The digital resources such as e- journals, CD/DVD's and audio-visual cassettes are available in all the college libraries. the full text databases, bibliographic databases, e-books and in house databases are available only in two colleges. The table also shows the availability of non digital resources in all the three libraries under study.

Table 3. Types of resources available in the library

Digital Resources	BDCH	CODS	SJMDCH	Non Digital Resources	BDCH	CODS	SJMDCH
e-books	18	10	—	Books	6618	3756	3104
e journals	21	13	04	Reference books	1216	964	416
Full text database	07	04	—	Journals	116	94	15
Bibliographic database	03	03	—	Bound Volume Journals	711	663	41
In-house database	11	04	—	Project Reports/ Thesis/Dissertations	31	24	—
CDs/ DVDs	84	57	36	Patents/standards	08	03	—
A/V cassettes	109	65	33	Microfiche	17	—	—
Any other please specify	—	—	—	Maps, Atlas, etc	20	12	06
				Magazines / News papers	28	16	19

6.2 Types of services available in the library

The librarians were requested to indicate the types of library services provided by the library to their users. It is very clear from the table- 4 that most of the services listed under are rendering by all the libraries except services like computerized bibliographical database Service Lending CD/DVD-ROM's and photocopy services.

Table 4. Types of services available

Types of Services	Response	
	Yes	Percentage
Lending of books and other reading materials	03	100
Lending of CD/DVD-ROM's	02	66.66
Reference Service	03	100
Computerized bibliographical database Service	01	33.33
Inter Library Loan Services(ILL)	02	66.66
Current Awareness Services (CAS)	03	100
On-line Public Access Catalogue(OPAC) / Web-OPAC Service	03	100
Internet-E-mail Service	03	100
Scanning and downloading	03	100
Indexing and Abstracting Service	00	0.00
News paper clipping Service	03	100
Translation Service	00	0.00
Photocopy Service	02	66.66
Any other (please specify)	00	0.00

6.3 Frequency of visit to library

The frequency of visit to library is depending upon nature of library collection, services and physical facilities provided by the concerned library. The following table indicates the frequency of visit to library by the users.

Table 5. Frequency of visit to library

Frequency	Faculty (n=61)	PG students (n=113)	Total (n=174)
Every day	27 (44.26)	86 (76.10)	113 (64.94)
Once in a week	19 (31.14)	16 (14.15)	35 (20.11)
Twice in a week	11 (18.03)	11 (9.73)	22 (12.64)
Once in a month	00 (0.00)	00 (0.00)	00 (0.00)
Very Rare	04 (6.55)	00 (0.00)	04 (2.29)

Number given in parenthesis represents the percentage

The above table indicted that majority (64.94%) of users visit the library every day followed by 20.11 per cent of them visit once in a week.

6.4 Time spent in the library

The respondents were requested to indicate how much time they are spending in the library for their teaching and learning activates. The table 6 indicated the responses that 33.62 per cent of students spent 2-4 hours whereas 44.26 percent of faculty members spent 1-2 hours. This indicates that PG students spent more time in the library than faculty members.

Table 6. Time spent in the library by the users

Particulars	*Faculty*	*PG students*	*Total*
Less than one hour	12 (19.67)	19 (16.8)	31 (17.81)
1-2 hours	27 (44.26)	13 (11.50)	40 (22.98)
2-4 hours	15 (24.59)	38 (33.62)	53 (30.45)
4-6 hours	04 (6.55)	16 (14.15)	20 (11.49)
More than 6 hours	03 (4.91)	27 (23.89)	30 (17.24)

Number given in parenthesis represents the percentage

6.5 Purpose of using digital resources

The users were requested to indicate their opinion toward purpose of using digital resources. The purposes of using digital resources are different from one user to another user. The responses received regarding this is analyzed in table- 7. The major purpose of using digital resources by the faculty members was to study the current events in dental sciences (96.72 %), for articles preparation and presentation (95.08 %) and to prepare teaching aids (91.8 %) whereas 98.23 per cent of students used for research activity, 95.57 per cent to collect and use of online database and 93.8 per cent used to study the current events in dental sciences.

Table 7. Purpose of using digital resources

Purpose	Faculties n=61	PG Students n=113	Total n=174
To prepare teaching aids	56 (91.8)	00 (0.00)	56 (32.18)
To study the current events in dental sciences	59 (96.72)	106 (93.8)	165 (94.82)
To search for specific diseases, drug & patient care information/literature	47 (77.04)	89 (78.76)	136 (78.16)
To collect information/literature on dental management	51 (83.6)	65 (57.52)	116 (66.66)
To collect and use of online database	53 (86.88)	108 (95.57)	161 (92.52)
For research activity	49 (80.32)	111 (98.23)	160 (91.95)
For articles preparation and presentation	58 (95.08)	77 (68.14)	135 (77.58)

Number given in parenthesis represents the percentage

6.6 Users opinion towards extent of use of digital collection

The users were requested to give their opinion about the extent of use of digital resources. The following table clearly shows the extent of use of digital resources by the faculty members and students.

Table 8. Users opinion towards extent of use of digital collection
5-More Frequently, 4-Frequently, 3-Occationally, 2-Rarely, 1-Never
Number given in parenthesis represents the percentage

It is evident from the above table that majority of faculty members (47.54%) and students (65.72%) were used e-journals most frequently. With regard to bibliographical databases 31.14 percent of faculty members and 37.16 percent of students were never used them. The CD/DVD's were the frequently used digital resources by both users. No user has ever used the in-house databases. This shows that the concerned library authority may not be maintained or updated in-house databases properly. Hence the library authority should concentrate on such issues and try to make proper use of them.

Digital Resources	Faculty (n=61)					PG Students (n=113)				
	5	4	3	2	1	5	4	3	2	1
e-books	03 (4.91)	14 (22.95)	04 (6.55)	03 (4.91)	37 (60.65	27 (23.89)	51 (45.13)	05 (4.42)	00 (0.00)	30 (26.54)
e-journals	29 (47.94)	06 (9.83)	00 (0.00)	00 (0.00)	26 (42.62)	98 (86.72)	08 (7.07)	00 (0.00)	00 (0.00)	07 (6.19)
Bibliographic Databases	11 (18.03)	16 (26.22)	08 (13.11)	07 (11.47)	19 (31.14)	36 (31.85)	17 (15.04)	18 (15.92)	00 (0.00)	42 (37.16)
Full text	00 (0.00)	06 (9.83)	13 (21.31)	00 ()	42 (68.85)	46 (40.70)	47 (41.59)	00 (0.00)	00 (0.00)	20 (17.69)
Clinical Databases	00 (0.00)	22 (36.06)	14 (22.95)	10 (16.39)	15 (24.59)	23 (20.35)	38 (33.62)	07 (6.07)	00 (0.00)	45 (39.82)
Online Dental Science	19 (31.14)	23 (37.70)	07 (11.47)	00 (0.00)	12 (19.67)	00 (0.00)	32 (28.31)	08 (7.07)	00 (0.00)	73 (64.6)
In- house Databases	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	61 (100)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	113 (100)
Online Lecture Notes	28 (45.90)	11 (18.03)	06 (9.83)	04 (6.55)	12 (19.67)	00 (0.00)	15 (13.27)	43 (38.05)	30 (26.54)	23 (20.35)
CD/DVD's	13 (21.38)	24 (39.34)	14 (22.95)	05 (8.19)	05 (8.19)	41 (36.28)	59 (52.21)	05 (4.42)	00 (0.00)	08 (7.07)

6.7 Users satisfaction towards library services

The user satisfaction is most important factor for any library. It all depends on identification of user needs and fulfill them with at most care. In this regard the users were requested to indicate their level of satisfaction towards the services of their respective libraries. The table- 9 reveals the data related to extent of satisfaction of users

Table 9. Users satisfaction towards library services

4-Fully satisfactory, 3-Partially satisfactory, 2-Not at all satisfactory, 1-No response

Number given in parenthesis represents the percentage

The above table clearly shows that majority (52.54 %) of faculty members were fully satisfied with Lending of Books & Other reading materials whereas 57.52 percent of students were partially satisfied. With regard to lending of CD/DVD's, most of the faculty members (72.13%) and students (61.06%) were partially satisfied. the users were fully satisfied with reference service and scanning & downloading of literature from the net. Majority of users have expressed their dissatisfaction towards current awareness services (CAS) and selective dissemination of information services (SDI). With regard to bibliographical database service, majority of faculty members (80.32%) and students (46.9%) were partially satisfied. 54.09 percent of faculty members have partially satisfied with online public access catalogue (OPAC) and at the same time majority of students (53.09%) have expressed their dissatisfaction.

Library Resources	Faculty (n=61)				PG Students (n=113)			
	4	3	2	1	4	3	2	1
Lending of Books & Other reading materials	32 (52.45)	19 (31.14)	10 (16.39)	00 (0.00)	48 (42.47)	65 (57.52)	00 (0.00)	00 (0.00)
Lending of CD/DVD's	00 (0.00)	44 (72.13)	17 (27.83)	00 (0.00)	00 (0.00)	69 (61.06)	44 (38.93)	00 (0.00)
Inter Library Loan Service	16 (26.22)	20 (32.78)	25 (40.98)	00 (0.00)	31 (27.43)	82 (72.56)	00 (0.00)	00 (0.00)
Reference Service	36 (59.01)	23 (37.70)	02 (3.27)	00 (0.00)	86 (76.10)	25 (22.12)	00 (0.00)	02 (1.76)
Bibliographical Database Service	00 (0.00)	49 (80.32)	12 (19.67)	00 (0.00)	31 (27.43)	53 (72.56)	29 (0.00)	00 (0.00)
Current Awareness Services (CAS)	09 (14.75)	11 (18.03)	36 (59.01)	05 (8.19)	12 (10.61)	38 (33.62)	63 (57.75)	00 (0.00)
Selective Dissemination of Information Service (SDI)	00 (0.00)	00 (0.00)	61 (100)	00 (0.00)	00 (0.00)	27 (23.89)	80 (70.79)	06 (5.30)
On-line Public Access Catalogue (OPAC)	14 (22.95)	33 (54.09)	06 (9.83)	08 (13.11)	15 (13.27)	38 (33.62)	60 (53.09)	00 (0.00)
Indexing & Abstracting Service	00 (22.95)	00 (54.09)	44 (9.83)	17 (13.11)	00 (13.27)	18 (33.62)	95 (53.09)	00 (0.00)
Newspaper Clipping Service	00 (0.00)	23 (37.70)	38 (62.29)	00 (0.00)	56 (49.55)	19 (16.81)	38 (33.62)	00 (0.00)
Scanning & Downloading of literature from the net	28 (45.90)	14 (22.95)	19 (31.14)	00 (0.00)	93 (82.30)	16 (14.15)	00 (0.00)	04 (3.53)
E-mail Service	21 (34.42)	36 (59.01)	04 (6.55)	00 (0.00	46 (40.70	30 (26.54	29 (25.66)	08 (7.07)
Reprographic Service	24 (39.34)	31 (50.81)	06 (9.83)	00 (0.00)	96 (84.95)	17 (15.04)	00 (0.00)	00 (0.00)

6.8 Type of CD/ DVD–ROM's used

The CD and DVD ROM's form the major sources of information for many users as they carry useful information on various topics of study. The users depends more on these electronic resources. Keeping this in mind a question was raised to indicate the types of CD/DVD ROM's used by them.

Table 10. Types of CD/ DVD-ROM's used

Types of CDs	Faculties	PG Students	Total users
CD-ROM's on Dental science	53 (86.88)	97 (85.84)	150(86.2)
Software CD's	06 (9.83)	11 (9.73)	17(9.77)
Multimedia CD's	49 (80.32)	81 (71.68)	130(74.71)
CD-ROM's on my specific subject	56 (91.8)	106 (93.8)	162(93.1)
Audio/Video CD's	28 (45.9)	31 (27.43)	49(28.16)
Indexing and abstracting CD's	05 (8.19)	19 (16.81)	24(13.79)

Number given in parenthesis represents the percentage

On an analysis it is come to know that majority of both faculty members and PG students used the CD/DVD ROM's on specific subject (93.1 %), on Dental science (86.2 %) and multimedia CD's (74.71). The software CD's and audio-visual CD's are less used by them.

6.9 Success rate in finding required information in Internet and CD-ROM's

Searching information in the internet is a matter of great concern for majority of users. The extent of satisfaction of users depends on their success in finding the required information. In this regard users were asked a question to know the success rate in finding the required information in Internet and CD-ROM.

Table 11. Success rate in finding required information in Internet and CDs

Sl. No.	Success rate in finding required information in Internet	Faculties	PG Students	Total
a	100%	08 (13.11)	37 (32.74)	45 (25.86)
b	75-99%	44 (72.13)	39 (34.51)	83(47.7)
c	50-74%	07 (11.47)	25 (22.12)	32(18.39)
d	25-49%	02 (3.27)	07 (6.19)	09(5.17)
e	Less than 25%	00 (0.00)	05 (4.42)	05(2.87)
Success rate in finding required information in CDs:		Faculties	PG Students	Total
a	100%	15 (24.59)	31 (27.43)	46(26.43)
b	75-99%	33 (54.09)	46 (40.70)	79(45.4)
c	50-74%	07 (11.47)	29 (25.66)	36(20.68)
d	25-49%	06 (9.83)	07 (6.19)	13(7.47)
e	Less than 25%	00 (0.00)	00 (0.00)	00(0.00)

Number given in parenthesis represents the percentage

It is evident from the above table-11 that 83 (47.7%) users expressed that their success rate is in-between 75-99 % followed by 45 (25.86%) users felt that they are 100 % successful and 32 (18.39%) users were in between 50-74 %. With regard to finding information in CD-ROM's about 79 (45.4%) users were in the range of 75-99 % and 46 (26.43%) users opined that they are cent percent successful followed by 36 (20.68%) users felt that they were in between 50.74 %. The success rate in finding required information is more are less same in both internet and CD ROM's.

7. CONCLUSION AND DISCUSSIONS

Today's users have their information needs met via a number of options. They can use either print formats or access online library resources and services via networks. Due to the needs of dental professionals for high-quality information, dental libraries have been adopting digital resources to provide information and services. Digital resources have exploded in popularity and use. They can enable innovations in teaching, and they increase timeliness in research as well as increase discovery and creation of new fields of inquiry. But the ability to use digital resources efficiently depends on basic computer skills, knowledge of what is available and how to use it. The present study collected the opinions of the faculty members and PG students about use of digital resources and services in dental college libraries. The study makes some recommendations based of the findings to optimize the use of resources. There is a need to create awareness among the faculty members and students to use digital resources. In order to support the use of primary information resources, the use of full-

text articles should be encouraged. Additionally, user's skills in searching information from databases, and reading full-text articles should be improved by organizing training programme. Because, searching bibliographic database containing references to journal articles can provide only a fraction of the information available in the original article. Therefore, these are not always a sufficient source of information. Hence, the extent of utilization information in the form of full-text documents should be encouraged in learning the core issues of the curriculum by the users. The study also made some recommendations that an updated online public access catalogue (OPAC) of digital resources should be made available in the library portal. Inter library loan facility should be provided to meet the research needs of the faculties and PG students of these colleges. The library should acquire adequate number of computers with latest specifications and continue to acquire and provide high speed network access to electronic resources. There should be complete campus networking with internet browsing facility to the staff room as well as hostels. The library plays a leading role in faculty-library relationships and in instructional services such as orientation and training in use of library resources. If efficient and effective use is to be made of library's digital resources and services, then user training will have to increase in both intensity and coverage. It is important to remember that the ability of library staff to keep up to date is necessary, and, therefore, training for them is crucial as well.

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Availability Of Web Resources On Selected Concepts Of Library and Information Science, Search Engines Yahoo, Google, Altavista and Dogpile: An Explorative Study

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Abstract: This paper will present brief information on web resource's definition, concepts, and Benefits of Web services, about a web design and www and also explained the search engines that have been important for information for educational and scholarly purposes. Different search engines have different capacity in covering, detecting and supply the information for the users in different context and purposes. Hence this study is selected Yahoo, Google, Alta Vista and Dog pile and finally tested. For testing used LIS E-books on Library Administration, Cataloguing, Library Automation, Classification and Library Management. The engines are compared in actual strength of the collection and also in particular collection on the selected concepts.

Keywords: Web Resources, Search Engines.

1. INTRODUCTION

The growth of World Wide Web (www) has been one of the most remarkable developments in the recent year. It has rapidly gained popularity and has become most widely used application of the Internet. Today, the World Wide Web has emerged as the most powerful medium for information publishing and access. A plethora of information sources for education and research are available on the Web including scholarly journals, technical reports, thesis, courseware, content page, data set, patents, reference sources and discussion forums. The friendly user interface and hypertext features of Web have been attracting a significant number of users as well as information providers. As a result the Web has become an ocean of all kinds of information or data, making any query into the huge information reservoir extremely difficult. In order to overcome this difficulty in retrieving information from WWW, several companies and institutions quickly developed various aids called as search engines. The search engines require different search strategies to retrieve information on the Internet.

1.1 Define Web services?

"We believe the definition of Web services spans the whole spectrum. In terms of simple Web services, it's a discrete process that gets information and doesn't depend upon a prior process - for example, if you're looking up a currency exchange and you want to know what the U.S. dollar amount is for the French franc.

Complex Web services are multiple discrete transactions integrated with multiple trading partners. An application is invoked by another application - looking up a business partner, searching a UDDI and receiving an interactive display with your results."[1]

1.2 Concept of Web Services

"As the Internet has become more sophisticated and programming standards such as XML, simple object access protocol (SOAP), and hypertext transfer protocol (HTTP) have matured, application integration has evolved to the next generation with Web services. The concept of Web services is to

integrate disparate systems regardless of platform or technology by utilizing the Internet and Web technologies. In order to create this scenario, a Web page "wrapper" is placed around a system that accepts SOAP commands. Having various wrapped applications that accept this language, SOAP becomes a common protocol upon which these applications can interact and share information.

In essence, Web services have the ability for any two applications to communicate *via* a standard data and command representation semantic (XML and SOAP). Instead of relying on the underlying platform or technology of each application, standards create the means for this communication. With this Web-based interaction, it is now possible for a COBOL application running on a mainframe to integrate with a Java application running on a UNIX server in real time without many of the integration issues that arose with the reusable component and EAI adapter methods. At this point, Web services are the most sophisticated means of integration, whether within an enterprise or on the public Web".[2]

1.3 Benefits of Web services?

"They're dynamic. They'll be fashioned based on responsive environments and customer needs. They'll offer a wider range of services, and they'll be able to integrate an application over a wide-area network in a dynamic fashion.

This is possible using the standards for interoperability that are in place - the standards can invoke one application to another.

Some concerns really have to do with ease of implementation. Right now, the dialogue [surrounding Web services] is tech-oriented around traditional speeds and feeds".[3]

1.4 What is Web Design?

"**Web page design** is a process of conceptualization, planning, modeling, and execution of electronic media content delivery via Internet in the form of technologies (such as markup languages) suitable for interpretation and display by a web browser or other web-based graphical user interfaces (GUIs).

The intent of web design is to create a web site (a collection of electronic files residing on one or more web servers) that presents content (including interactive features or interfaces) to the end user in the form of web pages once requested. Such elements as text, forms, and bit-mapped images (GIFs, JPEGs, PNGs) can be placed on the page using HTML, XHTML, or XML tags. Displaying more complex media (vector graphics, animations, videos, sounds) usually requires plug-ins such as Flash, QuickTime, Java run-time environment, etc. Plug-ins are also embedded into web pages by using HTML or XHTML tags".[4]

1.5 About WWW

"Tim Berners-Lee is credited with having created the World Wide Web while he was a researcher at the European High-Energy Particle Physics lab, the Conseil Européenne pour la Recherche Nucleaire (CERN), in Geneva, Switzerland. A tool was needed to enable collaboration between physicists and other researchers in the high energy physics community.

Berners-Lee's proposal was an extension of the gopher idea but incorporated many new ideas and features. It was also inspired, in part, by the concept of hypertext and some of Ted Nelson's work on Xanadu.

Three new technologies were incorporated into his proposal. Briefly, they were HTML (HyperText Markup Language) used to write the web documents, HTTP (HyperText Transfer Protocol) to transmit the pages, and a web browser client software program to receive and interpret data and display results.

An important concept of his proposal included the fact that the client software program's user interface would be consistent across all types of computer platforms so that users could access information from many types of computers".[5]

2. OBJECTIVES OF THE STUDY

1. To identify the search engines which are eligible to give web information very effectively?
2. To observe if adequate provision of information is in regarding to one subject
3. To determine how adequate of the information provided by the search engines in selected key points.
4. To find out the number of documents available in LIS on selected key subjects at a search.
5. To asses and find out the capacity and coverage of information of the selected search engines.

3. METHODOLOGY

The author used Search Engines, Google, Yahoo, Alta vista and Dogpile to collect the data on LIS E-Resources, tested on a selected key subject such as Library Administration, Cataloguing, Library Automation, Classification and Library Management. Tested all these search engines on their Reliability, Responsiveness, Assurance and Empathy. An attempt is made to present the total number of documents available from this selected search engines

3.1 WHAT IS SEARCH ENGINE?

The search engine is a tool which helps in the retrieving information from the Internet. It is programmed in such a way what it indexes the web and accordingly builds their databases. When the query has entered in the search engine, it checks its index with the query. Then relevant matches are retrieved and returned as 'hits' or 'search results'. In other words search engine acts as a searchable index of web pages of the world.

3.2 FEATURES OF SEARCH ENGINES

3.2.1 Tangibles

- Information should be well organized
- Different search methods should be available
- A large amount of information should be accessible
- It should allow narrow search topics
- multiple resources are available
- within a less time can access information
- less cost

3.2.2 Reliability

- There must be good syntax consistency for the key words in searching
- Search results are relevant to the query

3.2.3 Responsiveness

- It should provide search results quickly

3.2.4 Assurance

- There should not be any repetition of pages/sites
- There should offer natural language searching
- Information should be up-to-date

3.2.5 Empathy

- The layout upon first impression should be easy to understand
- It should offer natural language searching
- There must be help screens, introductory pages or sample searches to guide users
- It should offer language selection for documents written in specific language

3.3 How Search engines works

A search engine operates, in the following order:

- Web crawling
- Indexing
- Searching

Web search engines work by sorting information about a large number of web pages, which they retrieve from the WWW Itself. These pages are retrieved by a web crawler (sometimes also known as a spider)-an automated web browser which follows every link it sees.

Exclusions can be made by the use of robots .txt. the contents of each page are then analyzed to determine how it should be indexed(for example, words are extracted from the titles, headings, or special fields called meta tags). Data about web pages are stored in an index database for use in later queries. Some search engines, are store all or part of the source page (referred to as a cache) as well as information about the web pages, whereas others, are store every word of every page they find. This cached page always holds the actual search text since it is the one that was actually indexed, so it can be very useful when the content of the current page has been updated and the search terms are no longer in it. This problem might be considered to be a mild form of link rot, and some search engines handling of it increases usability by satisfying user expectations that the search terms will be on the returned web page. This satisfies the principle of least astonishment since the user normally expects the search terms to be on the returned pages. Increase search relevance makes these cached pages very useful, even beyond the fact that they may contain data that may no longer be available elsewhere. When a user comes to the search engine and makes a query, typically by giving key words, the engine looks up the index and provides a listing of best-matching web pages according to its criteria, usually with a short summary containing the documents title and sometimes parts of the text. Most search engines support the use of the Boolean terms AND, OR and NOT to further specify the search query. An advanced feature is proximity search, which allows users to define the distance between keywords.

3.4 Search Engines Advantages

- Search Vast database
- Very easy to use
- Sophisticated searching often available
- Normally global

3.5 Search Engines Disadvantages

- Automated method of collecting information is rather crude
- Information can be out of context
- May produce out of date sites.
- Often funded by advertising

4. PERSONALIZING SEARCH RESULTS

Table-1: Availability of e-books in different search engines

Search Engines	*Availability*	*Percentage (%)*
Google	20,33,000	64.88
Yahoo	7,23,390	23.08
AltaVista	3,76,900	12.03
Dog pile	347	0.01
	Total=31,33,637	Total=100

This table reveals that out of 31,33,637 e-books available on library and information science among them, 20,33,000 of the books are available in Google search, 7,23,390 of the e-books are available in yahoo, 3,76,900 are available in AltaVista and 347 of the e-books in dog pile.

Table-2: Availability of important e-books on LIS in different search engines

Key words	Search Engines											
	Google			Yahoo			AltaVista			Dog pile		
	*Ava	*Rel	*Per	*Ava	*Rel	*Per	*Ava	*Rel	*Per	*Ava	*Rel	*Per
Library Adminis-tration	2,72,000	5	19.23	76,100	3	25	76,300	2	28.58	69	1	20
Cataloguing	2,89,000	2	7.70	3,390	2	16.67	51,500	1	14.28	77	1	20
Library Automation	6,93,000	10	38.47	41,900	4	33.33	32,300	1	14.28	61	1	20
Classification	3,92,000	3	11.53	4,33,000	2	16.67	48,600	1	14.28	68	1	20
Library Management	3,87,000	6	23.07	1,69,000	1	8.33	1,68,200	2	28.58	72	1	20
Total	20,33,000	26	100	7,23,390		100	3,76,900	7	100	347	5	20
* Star mark shows Ava= is Availability, Rel=Relevance and per=Percentage												

This shows that a large majority of the e-books stored in Google than other search engines and among these four selected search engines dog pile has limited e-books such as 347. From this study I find out the Search Vast database, Very easy to use and Sophisticated searching often available.

The results from the study shows that the search engine Google is more number of collection on LIS E-books on Library Administration, Cataloguing, Library Automation, Classification and Library Management than of other search engines. The next highest collection is in Yahoo. By this observation the search engines, such as 'Google, store all or part of the source page (referred to as a cache) as well as information about the web pages, whereas others, such as Alta Vista, store every word of every page they find. This cached page always holds the actual search text since it is the one that was actually indexed, so it can be very useful when the content of the current page has been updated and the search terms are no longer in it. The Google's handling of it increases usability by satisfying

user expectations that the search terms will be on the returned web page. This satisfies the principle of least astonishment since the user normally expects the search terms to be on the returned pages. Increase search relevance makes these cached pages very useful, even beyond the fact that they may contain data that may no longer be available elsewhere. Some how more facilities like Reliability, Responsiveness, Assurance and Empathy are available form these search engines.

5. FINDINGS

1. Comparatively Dog Pile, Google, Yahoo and Alta-Vista are had more information.
2. Among them, Google is providing more information and next is Yahoo.
3. Subject on Library Automation in the Google 6,93,000 documents are available and among them (38.47%) is useful.
4. On Library Management 3,87,000 are available and among them (23.07%) is useful
5. On Classification 3,92,000 are available and among them (11.53%) are useful
6. Remaining subject Library Administration and Cataloguing are totally less number that is less than 3 lakh
7. other search engine Yahoo is better in providing information and Alta-Vista and Dog Pile are not providing much information

6. CONCLUSION

As we travel in to the future, WWW our world is becoming more interconnected and interdependent. Information is becoming an international commodity. Search engines are very important to collect kinds of information and their information list is varying one time search to another time search. Accordingly by the observation of search engines not all the search engines are providing much information regarding to one specific subject. Comparatively other search engine Alta Vista and Dog pile the Google and Yahoo are better search engines in providing bulky information with good manner and also show grammar errors. So, finally it concluding that the web sources are very advantages and each one want information and select a right search engines other wise it can vast the time.

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Building and Managing Electronic Resources in a Networked Environment: A Modular Approach

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Abstract: This paper examines the challenges that rapid growth in the number of electronic resources and in the complexity of managing e-collections and to develop Electronic Resource Management (ERM) systems not only for managing e-collections and also for building the e-resources throughout the life cycle in addition to this ERM systems helps to aiding collection-development decision making. Finally the paper describes the ERM process through which one can understand how ERM can be build and maintain in the Networked environment.

Keywords: Building of e-resources, Electronic Resource Management (ERM), Networked Environment, Prototype Model

1. INTRODUCTION

Widespread transition of knowledge from print format, to electronic format has also given rise to the problem of its building and effective management of Electronic Resources in networked environment (Vinitha *et al.*, 2008)[1]. Many developments in library supervision over the past century have enabled librarians to offer many user friendly services, electronic based information however it is not simply other new form, but perhaps the most important source of information developed in these decades. The historical significance of electronic publishing is similar to that of the printed book and has profound effects on every face of the future for the librarians. There have been many technological advances that had altered the very basic information of a library like meeting information needs of the user. The ways in which information is produced, delivered and accessed have changed dramatically. The major changes have led create; develop and manage electronic resources. Electronic resources basically lay up of materials in electronic format and manipulate large collection of these materials effectively. Their will be a vast population of users scattered around the globe, who are able to access easily and conveniently the complete contents of thousands of repositories containing texts, images, sound recordings, videos, maps, scientific and business data, as well as hypermedia combination of these elements (Ramesha *et al.*, 2008)[2].

2. SIGNIFICANCE OF ELECTRONIC RESOURCES IN 21ST CENTURY

The evolution of printed resources to the electronic resources has made users to think of new technology and tools to access electronic resources accurately with maximum speed. Printed resources have become more expensive and not readily accessible to the users in their busy schedule, they look forward for accurate and easy accessible information, where the modern technology electronic resources meets their demands, the technological advancement those have occurred under the umbrella of developments has led to tremendous changes in the process of information generation, storage, retrieval and communication. In the wheel of present IT age, no library or information center think on only print sources of information for meeting the requirements of their users, the world is marked with the new technologies, which has geared up libraries and information centers to provide better and faster ways to generate, print, and transport information. Information is a strategic resource for

every activity. Earlier information generated from different activities was recorded in different print forms. But now, current trends and developments suggest that information is growing exponentially both in conventional and unconventional forms. Digital libraries ,Institutional libraries, electronic resources are the present day murmur words, which on one hand show impact of technologies on the present day libraries and on the other side, challenges being faced by information professionals to bind technology to manage electronic information resources in this era.(Seema Vasisita, 2008)[3]

3. ELECTRONIC RESOURCES: MEANS, METHODS AND ITS TYPES

Wikipedia (online encyclopedia)[4] defined as "Any publishing available information resources which can be accessed in a personal computer, these include commercially produced resources such as bibliographic databases (accessed online or via CD-ROM) electronic journals and electronic books as well as resources that have been made freely available via on the internet". The information sources which is available in the electronic or digital format on the internet, CD-ROM or different electronic media (Digital library federation, 2004)[5]

3.1 Types of Electronic Resources

1. Online resources: Resources which are used with the help of internet

- *Static E-resources:* They contain fixed information and never change form
- *Dynamic E-resources:* Such documents also contain fixed information, but this information can change its outward form (Multimedia CD-ROM)
- *Living E-resources:* Such e-resources can change their outward appearance and their embedded information (e.g. information on the WEB). These are the server and client based information resources. These are also called remote access resources or online resources because the location of the server is somewhere else.

All the types of online resources mentioned can be broadly grouped into two categories

(a) *Subscribed Electronic Information Resources (SEIR):* To access this category of ER, some subscription amount/fees have to be paid in to the publisher/owner.

(b) *Free Electronic Information Resources (FEIR):* Such resources are freely available on the internet and can be divided in to subcategories like, Open access journals/free journals, Information available at Institutional Repositories, Organizational/Individual's Websites, Individuals Blogs/ Professional Discussion Forums

Apart from these online e-books, e-journals, e-these, e-dictionaries, e-directories, e-handbooks, e-newspapers, e-encyclopedias, Web rings, Library network databases, Library Websites FAQs, WEB OPACs, Digital archives, Bulletin Boards, Virtual Conferences, Web Exhibitions, Virtual help Desks etc.,

2. Off line resources: Resources which are used in absence of internet such as CD-ROM, Jukebox, Audio Visual Aid etc.

4. REVIEW OF LITERATURE

An effort is made to study the result of works carried out in this area, some of the unique works related to this fields of research are noted below but not limited to the following:

Maria (2005),[6] studied some unique challenges for management of e-resources in libraries such as multiple manifestation of the same resources, maintenance of volatile URL's, tracking and maintaining electronic holdings and making resources available from within the library as well as remotely. Barrie Locke (2006)[7] highlighted that the ERM system rapidly gaining importance and reorganization as a key component of enterprise content management strategies, the proliferation of digital assets in multiple formats is presenting significant challenges to IT department as organization are coming to realize that systems to manage these assets are essential valuable and a best business practice in corporate sector. On the other hand another important and widely used content management tool such as CMS thoughtfully presented by Scott Abel (2007).[8] Content management system (CMS) software, usually implemented as a web application for creating and managing HTML content. It is used to manage and control the large dynamic collection of web material. CMS facilities content creation, control, and editing and much essential web maintenance function.

Sadeh (2005)[9] conducted a study to understand the intricacies of building and management of e-resources including electronic journals "aggregator" services and citation services that also provide full text consume a layer and larger proportion of library acquisitions budgets and further he listed out a number difficult to manage e-resources such as acquisitions process, Different licensing restrictions and Technology and Technical support. These are the some of the challenges that electronic resource management claim to address. Timothy (2001)[10] is compared between traditional approach (pre digital context) and the emerging organizational model (digital context) can help us better define the relationships between collection management and the activities aimed to ensure the long term preservation and management of library resources. The need to manage efficiently electronic resources and to incorporate them into their services pushes libraries to profoundly reconsider the procedure and the technical tools to adapt to the changing situations.

Ruth (2005)[11] interviewed LIS professionals to understand the process of analyzing electronic resource management system and provide a status report of license mapping in academic libraries. Ruth also highlights the challenges and opportunities for the mapping process. These conversations in the early stages of ERM implementation better conceptualize resource needs and effective practices for license mapping. In the absence of comprehensive commercial solutions some institutions themselves developed systems that deal with various aspects of e-resources management. Among the prominent in the ERM system process is Digital Library Federation (DLF, 2005).[12] The DLF is serving as a catalyst for the development of electronic resource management systems and functionality in addition to DLF a variety of companies including Integrated Library System (ILS) vendors, subscriptions agents and publication access management services (PAMS) are all involved in electronic resource management development. The advantages and disadvantages each type of vendor offers are discussed, eleven of these companies were surveyed about the availability, compatibility, functionality and distinguish features of their ERM system, these vendors also provided their advise and guidance on how a library can begin preparing for implementation of an ERM system **(Raschke and Weiner, 2004).**[13] Davis Susan (2005) suggested a model for electronic resources interest group of the association for library collections and technical services provided several institutions and he was also describes about their implementation of a commercial electronic resource management system at the 2005 American Library Association midwinter conference.

5. BUILDING OF E-RESOURCE: A MODULAR FRAMEWORK

Information and Communication Technologies (ICTs) is defined as a diverse set of technological tools. ICTs ate the amalgamation of computer, telecommunication and other multimedia technologies.

The technological developments are influencing each and every walks of human life and there is no exception for libraries and information centers. The central purpose of libraries is to access to information and technologies facilitates to acquire, process, manage and dissemination of information both locally and globally. In the process of building e-resources, libraries and information centers can build the e-resources in many ways – subscription, library consortia, open access, links to virtual libraries and through institutional repositories. The following modular framework (figure 1) shows that the building of electronic resources in the networked environment. The authors also explain how the framework is executable in the real working environment with proper justification in the presiding lines of paragraphs.

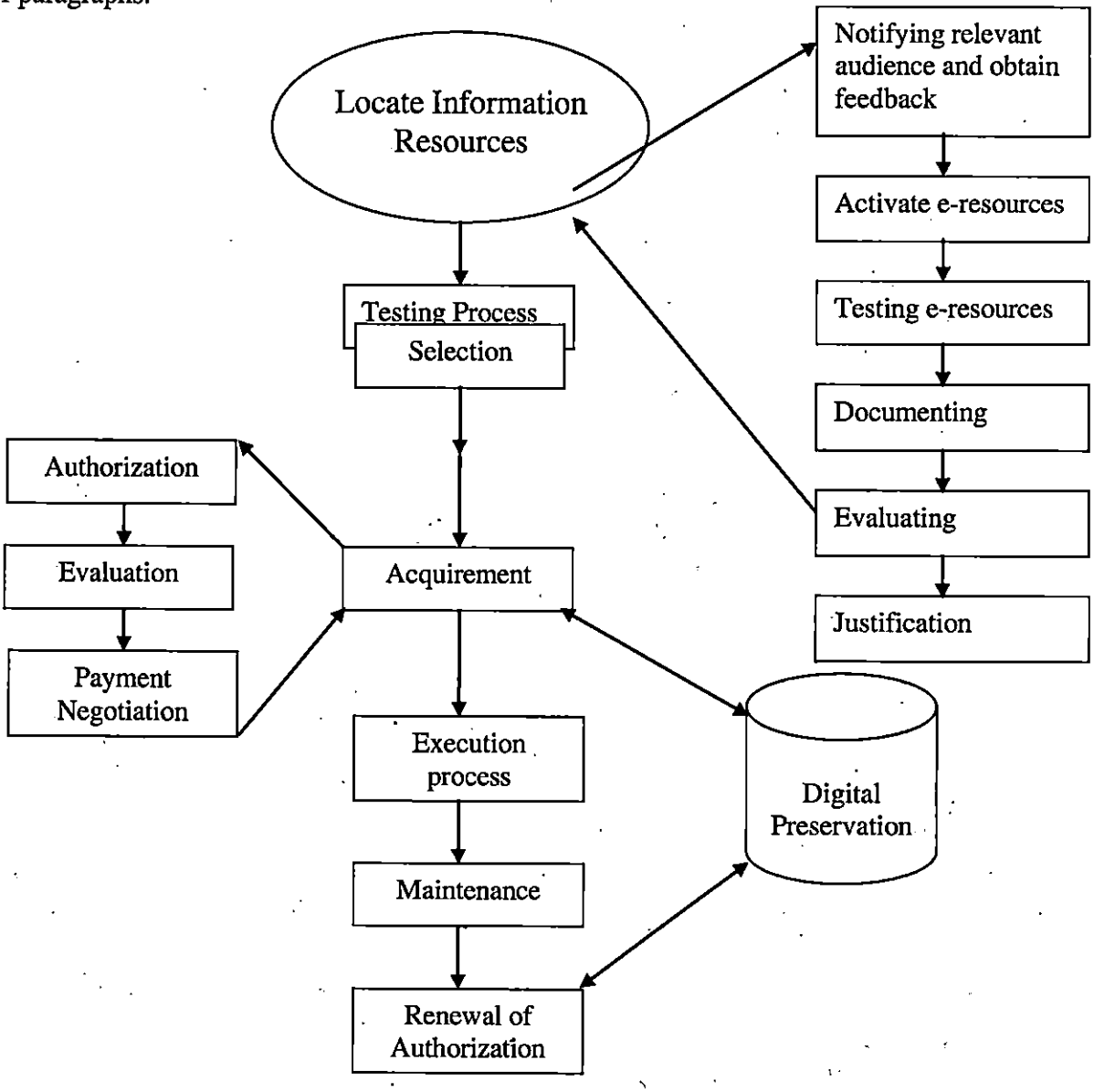


Fig.1: Building of E-resource: A Modular Framework

- *Locate Information Resources:* All the information about the e-resource according to the users request is located from all types of e-resources.

- *Testing Process:* it is necessary to test the e-resource before deciding whether to purchase a license for it. A test enables to offer the e-resource to some or all users- who may include patrons and librarians alike and then should take a decision based on their feedback. During the test process, the activation of the e-resource in the desired areas of the library environment, notifies the relevant audience, and the feedback is obtained. Considerable attention is to be paid to specific issues when testing an e-resource. It is necessary to document the issues related to web browser and plug-in compatibility. Finally, it's needed to evaluate the usability of the interface. When the trial is complete, one should be able to justify the e-resources selected.
- *Selection:* Once the testing process is over, one can select whether to acquire the e-resource or not to purchase the e-resource
- *Acquirement:* If decided to go forward and subscribe to the resource, the acquirement process requires additional level of detail such as information about the authorization and the availability of the resource. The entire process has to be evaluated for accuracy and proper functioning. Finally the negotiation and mode of payment is to be decided.
- *Execution process:* it is a major issue when dealing with e-resources where it has to ensure that it is well used. First, make sure that users can access it easily, Issues such as access by specific user groups or by remote users (for instance, proxy setup) also need to be solved, and problems such as the temporary unavailability of the resource, and changes in the provider's address should be taken care.
- *Maintenance:* A proper maintenance should be provided through out.
- *Renewal of Authorization:* An e-resource subscription is typically valid for a defined time period. When the period ends, the authorization of the subscription is to be renewed or cancel it. This decision is based on the information accumulated in the management system, such as the actual usage of the resource while it was available. Whatever the outcome of the decision – renewal or cancellation – the system needs to support it.

6. ELECTRONIC RESOURCES MANAGEMENT: A STATE OF THE ART TECHNOLOGY FOR E-RESOURCES

Electronic Resource Management (ERM) is the system that supports management of the information and workflows necessary to efficiently select, evaluate, acquire, maintain and provide informed access to electronic resources in accordance with their business and license terms (Anderson *et al.*, 2004)[14]

The ERM system should offer an integrated environment that supports both management and access, without maintaining duplicate systems. The system should offer a capacity for global updating and flexible addition of fields, it should offer the ability to bide fields and records from public view and have a single point of maintenance for each data element. It should support interoperation and dynamic data sharing with existing OPACs, web portals, library management systems and resolution services. It should offer user consistent information finally the ERM's should over time support the ability the store, access, search and generate reports of the information that it contains (Jewell 2001)[15]

7. ELECTRONIC RESOURCES MANAGEMENT: A PROTOTYPE MODEL

The concept of Electronic Resources management (ERM) can be clarified as a set of procedures that collects, processes, stores and disseminates the information to help and coordinate the activities

of decision making to remove uncertainty. The steps required for managing e-resources are more complex than those for print resources. A process that consisted of selecting, ordering, cataloging and binding now includes selecting, evaluating, approving, licensing, billing and registering access and is accompanied by a series of technical aspects, such as usability, performance, access technologies, public interfaces, troubleshooting and usage statistics. ERM is a time intensive and interactive process, often requiring more staff with a greater skill set at each stage.

The authors of this paper thoroughly checked the earlier studies using LISA and other indexing and abstracting databases and same as been presented in the review of literature. Based on authors experiences in the electronic resource management process and other working models are taking into consideration while developing following easy to understand prototype of design model has been developed with proper explanation in each process and same has been presented in the following figure.

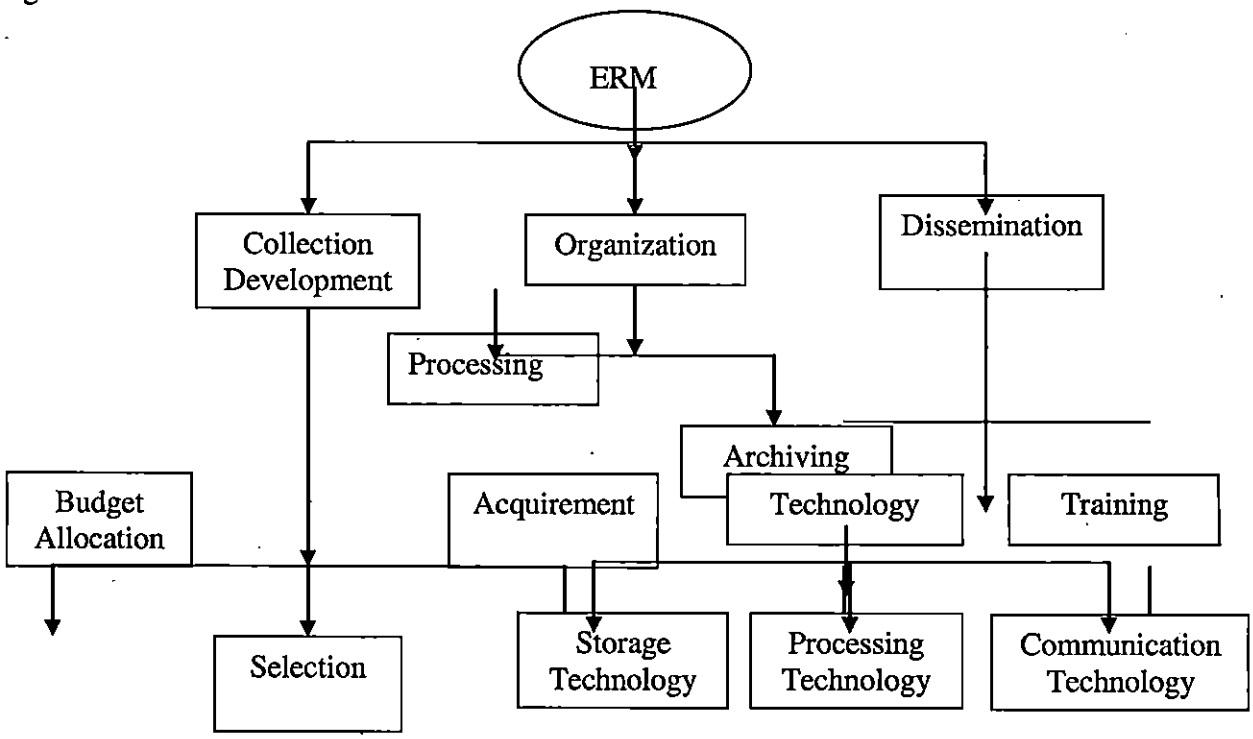


Fig. 2: Electronic Resources Management: A Prototype Model

- *ERM (Electronic Resource Management): ERM* is the sole to manage the information and provide the access to the electronic resources, in a network environment, which consists of various levels of divisions such as Collection Development, Organization and Dissemination, all the divisions mentioned are again do have various process, the work function of each divisions and their process is explained below.
- *Collection Development:* The prime function of Collection Development is to acquire more electronic resources and owned for the permanent collection. It also includes works stored elsewhere for which it has permanent ownership rights. It should have sound planning, principles and policies for managing ER which helps to justify the goals of ERM. Effective collection development generally consists of following process;

- *Budget Allocation:* proper budgetary allocation is necessary do develop need based and balance collection.
- *Selection:* ER selections require more extensive set of criteria like technology service complications, archival concerns etc must be concerned. Some of the criteria are comprise of content analysis, ease to use, maintenance free or requiring less maintenance. A number of ER are available free of cost, only thing needed is to provide hyperlinks to the main websites. The selection process of ER must be need based rather than being proactively anticipating the demands of the users.
- *Acquirement:* The term "Acquire" refers to any ER, online or physical, which receives through its various, typical acquiring process. When acquired ER from publishers or venders its should be properly documented and consider the financial, legal and access accepts for acquirement.
- *Organization of ER:* The main function of ER organization is processing and archiving.
- Processing is nothing but proper processing of acquired ER is must for proper information retrieval, it usually group them in regard to subject, kind, form and nature. Giving certain codes for each source, put the like entities together, the code is based on international classified system. The processed codes can lead to find and retrieve the required information contained in them.
- Archiving is the process of maintaining the ER in a condition suitable for use and continued ability to render or display the content. The acquired and processed ER are archived for further retrieval of right information to the right users.
- *Dissemination:* It is the form in which the ER are presented to the user, it perform by publicity materials like brochures, awareness programs, presentations at seminar and conferences, hosting a website. There is a great need to organize the periodic presentation at eh door steps of the users, this will help the users to know the existence of ER for their better and effective utilization. Technologies required and training of staff & users are two important component of Dissemination process.
- *Technology:* ER are machine dependent and may not be possible to access the information unless, there is appropriate hardware and associate software. It require possession of certain specific technologies like storage technology, processing technology and communication technology
- Storage Technology- is a variety of devices to store and retrieve information in electronic form such as Magnetic tapes, cassettes, floppy disks, hard disks, DAT tape, CD-ROM, smart cards etc.
- Processing Technology- create the systems and applications software that is required for the performance of digital net work
- Communication Technology- Primarily to communicate information in digital form, display technologies (variety of out put devices).
- *Training:* Even though information is easily available in the form of ER, extensive training is required for proper use in the following fields like, (i) Sources of electronic information, (ii) Techniques of evaluation (iii) Maintaining the quality of information (iv) To be aware of complex technologies within which the information is embedded. It is also important to train the user for effective access of ER.

8. CONCLUSION

Technologies have evolved from print to electronic resources, the technology changes have forced publishing, editing, translating, database creation, computing and learning to come closer to enhance the quality, speed and coverage in the respective fields. There is indispensable need to develop a suitable and effective model for Electronic Resource management (ERM) and to provide better services to endow users. This article comprises the step by step flowchart of building ER and routes how to manage ER in networked environment in an effective way, where it helps in easier management and deeper searching and better tracking of all ERs. Effective management of ER generates satisfaction among users community and also ensure excellence in collections and services.

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Electronic Media and Reading Habits

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Abstract: This article deals with Electronic Media and its impact on Higher Education. Describes kinds of Electronic Media. This paper gives statistics of top 20 countries in Internet Usage. It highlights the reading habit. Briefly describe about the Reading Habits in Digital media.

1. INTRODUCTION

Reading is an integral part of human life. As food is necessary for our body so is the reading for our mind. "An empty mind is a devil's workshop", says a proverb. To keep our mind full of positive ideas, we must develop a habit of reading quality books. The practice of reading good books will build our personality in a constructive way. To read, in common parlance, means, going through a book or paper, printed or otherwise, for deep understanding or just for pleasure. A person who is not able to read and write may be compared to a blind person. But today, the technology has enabled even a blind person to learn how to read and understand the subject in the book. Now, the literacy rate in the country is increasing gradually and the day is not far away when we can achieve the dream of being a complete literate nation. The credit must go to our Government for its sincere efforts in educating its general public through some special projects like "Sarva Shiksha Abhiyana". The Government aims to build a strong and stable nation. And it is possible only when all its citizens become literate and knowledgeable.

With an increasing amount of time spent on reading electronic documents, a screen-based reading behavior is emerging. The screen-based reading behavior is characterized by the long duration of time spent on browsing and scanning, keyword spotting, one-time reading, non-linear reading, and reading more selectively, while less time is spent on in-depth and concentrated reading. Decreasing sustained attention is also noted. Annotating and highlighting, while reading, is a common activity in the printed environment. However, this "traditional" pattern has not yet migrated to the digital environment where people read electronic documents.

The advent of electronic media and the growing collection of electronic documents have had a profound impact on reading. It was argued that the development of digital libraries "is participating in a general societal trend toward shallower, more fragmented, and less concentrated reading".

Previous studies attempted to explore reading in the digital environment by examining the evolution of reading or observing how people read documents (especially electronic documents) within a specific period of time. But the goal of this study is to explore reading in the electronic/digital environment from a different perspective, i.e., instead of observing how people read electronic documents, this study attempts to investigate reading behavior in the digital environment by analyzing how the reading behavior of people has changed over the years. Understanding the changes in reading behavior would help in designing more effective digital libraries and empowering the users in the digital environment.

2. IMPACT OF ELECTRONIC MEDIA ON HIGHER EDUCATION

Electronic media (E-media) is changing the way faculties teach and students learn. As technological advances are introduced into the academy, campuses are more and more attracted by the promise

and potential of E-media for enhancing access and learning. Faculty, staff and administrators need to understand what technology can and what it cannot do. E-media is seen by some as the panacea for budgets cuts: some see visions of hundreds of students sitting in front of monitors, with talking heads providing cheap, mass education. Others see technology as a critical complement to the educational experience, opening more opportunities for the learner than can be encompassed by one campus. Both visions are possible, but the first not particularly desirable. The Internet is changing the way universities teach and do the research. India has been a major seat of learning for thousands of years. Some of the country's universities are coming at par with the world's well-renowned top universities. The advent of UGC-INFONET has created a momentum in accessing the e-resources to faculty, students and researchers. Most of the University Libraries are well equipped with modern gadgets like computers, e-resources etc.

3. Reading is natural process of learning

Human beings are the supreme creations of God as they are endowed with the power of thinking. All the scientific and technocological developments, attainments and achievements are the outcome of the intellectual capacity of human beings. Despite this inborn capacity, they cannot attain intellectual perfection without involving themselves in the intellectual activities like reading. In the acquisition of knowledge, psychological and sociological factors play pivotal roles. In human beings, psychological learning takes place in different ways and by different methods of learning, for different age groups of learners, based on emotional factors, availability of means and guidence, etc. Reading is one of the important natural processes of psychological learning.

The basic reading skills involve LSRW (Listening, Speaking, Reading and Writing) which are imparted at the school level by language teacher. Effective reading requires a great deal of mental effort and concentration, as it is necessary for retention and comprehension. Faster reading requires:

- Quicker grasping of information,
- Screening the material,
- Reading for aggressive comprehension,
- Gisting of information to get the essential idea,
- Improving the vocabulary for better presentation of ideas

Reading techniques or skills could be improved through faster reading, skimming, scanning and reading slowly. Skimming results in pre-selected sections of the text to gain a general overview. Scanning helps in finding the specific piece of information. Faster reading could be adopted while reading the novels or literature pertaining to entertainment aspects. Difficult texts should be dealt with by slow reading for comprehension.

The World Congress convened by the UNESCO in London in June 1982 has reaffirmed its faith in the future of the Printed Book. By saying, it is a "Pre-eminent vehicle for information, education and research, and a source of culture and recreation, serving national development and individual human life" (Hasan,1984).

Reading habit is an act of interpreting printed and written words; it is a basic tool of education and one of the important skills in day-to-day life. We live in the world of print and electronic media of communication. Reading helps in acquiring new ideas in providing the needed information. It also helps to seek support for ideas and also adds to personal pleasures besides broadening our mental horizon.

4. Libraries are potential force of reading and learning

Library plays an important role, wherein the reader can develop reading habit. It is the library which creates the congenial atmosphere required to intensify the reading habit. Readers devote much of their time after enrolling themselves as members. Reading habit which plays highly significant role in educating the readers, also increases the level of education and standards in learning. Reading habits differ from gender to gender. It also depends on age and intellectual growth of a person. Library contributes to the creative intellectual enhancement of this skill and helps the society to become a learned society.

5. Electronic media: a boon for development

The advances of Electronic Media particularly in Information and Communication Technologies (ICT) have entered every sphere of human life and have brought the great transformation in the society. The Radio, T.V., Microforms, Computers, Internet, Video text, Fun text etc., have greatly influenced the living of even a common man. From the young to the old every one is fond of these and such other gadgets in whatever way it is possible for them to have. While these technologies were found to be luxuries a few decades ago, today they have become necessary means for the progress of the urban and the rural. The so-called global village, product of communication and information technologies, not only brought together people globally but enforced them share the ICT facilites for their survival. This boon of information technologies, that helped people to access information from any corner of the world within a few seconds, has certainly brought about changes in the way of people's looking for information, reading them or using them. It is intented that the so-called ICT or Electronic media would help people to progress, but at the same time it is feared that it would reduce the reading habits of the young and the old who need to be assessed further and found the truth in saying so.

The meaning of the term Electronic Media popularly called E-media, is not available in any language or technical dictionary or encyclopedia. Different dictionaries and reference sources have defined differently.

By analyzing the definitions a working definition of the term Electronic medium can be formed for the purpose of the study. With application to Library and Information Science, the term is defined as a material or configuration or device such as magnetic tape, floppy disc or electronic paper, including both storable and removable media, on which the data and instructions are recorded. The term is used for information storage, processing, access and dissemination. The term "impact" can be defined as an influence caused by a new concept of idea or technology.

6. Internet-World Internet users statistics

Internet is perhaps the most important development in the field of information technology that has been described as arguably the most complex structure yet discovered in the world. Internet is an open computer communication infrastructure and a network of networks. It is also known as the Cyberspace, Information Superhighway, the Net etc. Internet has enabled global level inter-connectivity of computers and computer networks. It is a traditional avenue for sharing research data and information. Internet has brought in a new era in global communications.

The growth of internet has been global and continuous. It is growing at a rapid pace. Today there are 1,407,724,920 Internet users (http://www.internetworldstat.com/ accessed on 6th June 2008)

Table 1: Internet Top 20 Users country wise

Sl. No.	*Country or Region*	*Internet Users Latest Data*	*Penetration (% Population)*	*% of World Users*
1.	United States	210,575,287	69.7&	18.0%
2.	China	162,000,000	12.3%	13.8%
3.	Japan	86,300,000	67.1%	7.4%
4.	Germany	50,426,117	61.1%	4.3%
5.	India	42,000,000	3.7%	3.6%
6..	Brazil	39,140,000	21.0%	3.3%
7.	United Kingdom	37,600,000	62.3%	3.2%
8.	Korea (South)	34,120,000	66.5%	2.9%
9.	France	32,925,953	53.7%	2.8%
10.	Italy	31,481,928	52.9%	2.7%
11.	Russia	28,000,000	19.5%	2.4%
12.	Mexico	22,700,000	21.3%	1.9%
13.	Canada	22,000,000	67.8%	1.9%
14.	Indonesia	20,000,000	8.9%	1.7%
15.	Spain	19,765,033	43.9%	1.7%
16.	Vietnam	16,511,849	19.4%	1.4%
17.	Turkey	16,000,000	21.1%	1.4%
18.	Australia	15,085,600	71.9%	1.3%
19.	Taiwan	14,500,000	63.0%	1.2%
20.	Philippines	14,000,000	16.0%	1.2%
	TOP 20 Countries	915,131,767	21.7%	78.0%
	Rest of the World	257,978,158	11.0%	22.0%
	Total World Users	1,173,109,925	17.8%	100.00%
(Source : http://www.internetworldstats.com/top20.htm)				

Internet usage in India is growing in steady pace. The following table shows the users of internet in India along with population as follows.

Table 2: Indian Internet Usage and Population Statistics

YEAR	Users	Population	% Pen.
1998	1,400,000	1,094,870,677	0.1 %
1999	2,800,000	1,094,870,677	0.3 %
2000	5,500,000	1,094,870,677	0.5 %
2001	7,000,000	1,094,870,677	0.7 %
2002	16,500,000	1,094,870,677	1.6 %
2003	22,500,000	1,094,870,677	2.1 %
2004	39,200,000	1,094,870,677	3.6 %
2005	50,600,000	1,112,225,812	4.5 %
2006	40,000,000	1,112,225,812	3.6 %
2007	42,000,000	1,129,667,528	3.7 %
(Source : http://www.internetworldstats.com/asia/in.htm accessed on 8th June 2008)			

7. Intranet

As internet growth has brought several technologies world wide, Big institutions started using internet technologies in their organizations. Usage of internet technology within the organization gave concept of Intranet. Now most of the business in the corporate sector is being done on intranet.

8. Full Text/Online Journals over Internet

Electronic journals and online journals are the most important scholarly publications available on the Net. An e-journal us the defined as any serial produced , published and published nationally or internationally via electronic networks. An e-journal is a full-text delivery system and differs from online journal and conventional bibliographic databases available on online. It can be thought as full text e-publication which many include graphics and images. Many printed e-journal are available on electronic form over internet.

9. Reading and Reading Habit

The concepts of "Reading and Reading Habits" as perceived from literature are given below.

Dhupkar (1994) explains that reading reflects the society's life style, the ideals, beliefs, curiosities and seeking soul of the people. Reading culture leads us to a revolution which springs from a sensitivity to surroundings, resulting in transformation with reference to ideals, progress and civilization apprehended by imagination and sensibility nurtured by the best of books enshrined in the greatest literature. The Oxford Dictionary (2003) defines Reading as a "Way of interpreting something". "An act or an instance of literary knowledge".

According to Cebeceiras, " It is not about to, and perhaps never will, disappear from the library: it is much too valuable, for it contains a treasury of information and enjoyment unobtainable in any other form." Therefore, reading instructs, entertains and transports (stimulates) : it is going to stay with us. Reading scores over viewing because it is personal, intimate and certainly more stimulating. Obviously, the Television cannot meet all these needs of man. (Riswadkar,1998)

According to Ranganathan (1968), Reading habit stands for "Releasing and exercising the creative ability of each member of the community in his own field and in his own measure". It is needed to extract creative abilities and skills from among the youngsters. It is necessary to indulge students in skillful and critical reading.

10. Reading Habit in Digital Media

The impact of Digital media on reading has increasingly been the object of empirical and theoretical exploration by researchers from a wide range of disciplines, notably psychology, computer science, education, literacy studies, and library and information science. Each discipline has developed its unique research focuses and methodology. It is not the purpose of this study to review all the different approaches and studies. Nevertheless, an examination of the related literature reveals that there are some essential studies that deserve closer attention.

With the growing amount of digital information available and the increasing amount of time that people spend reading electronic media, the digital environment has begun to affect people's reading behavior.

11. Conclusion

In an increasingly digital environment, readers (especially younger readers) are likely to gradually develop the screen-based reading behavior, and to increasingly use a variety of strategies (e.g. browsing and keyword spotting) to cope with the information-abundant environment. At the same time, readers will continue to use printed media for much of their reading activities, especially in-depth reading. In-depth reading usually involves annotating and highlighting. People's preference of paper as a medium for reading (especially in-depth reading) also implies that paper is unlikely to disappear in the digital age. In the digital age, printing for reading remains one of the major driving forces for the increasing consumption of paper. A number of digital reading devices have been designed to support reading electronic documents efficiently.

Since an entire generation that has grown up with new technology is likely to have different expectations of behaviors towards the use of digital media, studies on the demographic variables are needed to fully validate the findings.

An analysis of relevant indicators would provide a sensitive yardstick for anticipating reading behavior in the digital environment.

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Evaluation of Web Resources: An Analytical Study with Particular Reference to Science and Social Science Dictionaries

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Abstract: In recent years web has emerged as the most important and powerful medium for storage & retrieval of information. There is a tremendous growth in the number and variety of information resources available on the web. However one of the most serious and widespread objections against Web resources is that of the quality in many cases is doubtful. In this context this study made an attempt to evaluate selected science and social science dictionaries available on the web. Results of the study show that 68.75% (110 out of 160) sites are irrelevant and 27.5% (44 out of 160) of sites are relevant. Majority of web dictionaries have no graphics, references, hit counter, date of publication and date of revision. Study also suggests for improving the quality of web dictionaries.

Keywords: Web resources, Dictionary, Science and Social Science, Evaluation

1. INTRODUCTION

Today, the web resources have become a valuable, perhaps indispensable, resource in conducting research, not just because of the added convenience of rapid information retrieval and sharing, but because it also provides a means of making resources available that the printed media simply cannot. The availability and growth of the web resources offers all of us, an opportunity to find information and data from all over the world. Internet resources, in particular web resources, continue to proliferate at an astonishing rate. It is possible for almost any one to place anything on the web. Companies, organizations, educational institutions, communities and individuals serve as information providers for the electronic Internet community. This sharing of resources and information is an example of societal cooperation on a grand scale and has fostered professional and personal communications throughout the world.

These web resources, however, also present new challenges to the traditional scientific peer review process for the publication of research, since they can change in content very often. Furthermore, these online resources can disappear altogether, they also provide a unique challenge in terms of preserving our historical scientific knowledge and evaluating new resources as they arise. One of the most serious and widespread objections against information found on the World Wide Web is that the quality in many cases is doubtful. Retting (1996)[1] rightly points out that every web resource is not superior to printed resource because the quality of information available on the Web varies from excellent to poor.

2. NEED FOR EVALUATION OF WEB RESOURCES

When we use a research or academic library, the books, journals and other resources have already been evaluated by a librarian or by a mechanism set up by a librarian. When we use an index or a database to find information on any given topic, the index or database is often produced by a

professional or scholarly organisation that selects the journals to be indexed on the basis of their quality. Every resource we find has been evaluated in one way or another, before we ever see it. When we use the Web resources, none of this applies because there are no filters in between the user of information and web resources. Moreover information can be spread over the Internet by anyone without regard to accuracy, validity, or bias. Due to its global structure, which encompasses a variety of legal systems and cultures, it is like that any individual or nation is able to significantly influence, regulate, or change the chaotic state of flux that characterises the Web. So using and citing information found over the Web is a little like swimming on the beach without lifeguard. Hence there is a need to evaluate Internet information sources for following reasons:

- Information published on the web may not be authentic and author may not be qualified for writing the article and thus evaluation is necessary to decide these issues.
- Information found on the Web may not be current, reliable, and may not be filtered. Every information is meant for a specific group of audience and depending on the purpose or target audience the relevancy or accuracy of information can be judged. It is really necessary to know the target audience of the Web source and to decide whether that is useful to them or not.
- To decide whether web resources should be linked to a resource guide or library Web site.
- To judge the quality or appropriateness of web information for a particular query or user.
- It is part of the job of each librarians or information managers- to select what our users will find useful from this mass of information.
- Many libraries now maintain Web sites that have lists of web resources. Without explicit for selection of these sources, librarians wasting their user's time with tools of dubious value.

3. EVALUATION CRITERIA AND METHODOLOGY

There exists a significant literature on the evaluation of web reference sources. Criteria for print materials can in most cases be applied to the Internet domain, but evaluation criteria may be more critical in the "vanity publishing" environment of the Internet. Print publishing involves a series of editorial checks that tends to reduce the appearance of low-quality information. On the Internet, these checks exist to a lesser degree. With the growth in concern about quality of Internet information, an increased number of publications in the print literature and on the Internet address the issue of criteria for evaluating Internet information resources

Smith (1997)[2] has provided a comprehensive criteria foe evaluation of web resources viz., scope, breadth, depth, time, format, content, completeness, etc. Similarly Astroff (2000)[3] also lists out the evaluation criteria for web resources viz., information structure and design, relevance, scope, validity of content, accuracy, navigation within the document, quality of links, aesthetic and affective aspects, references, hit counter, date of publication, date of revision etc. Studies of Paul Metz (2000)[4] and Cottrell (2001)[5] Biradar & Sampath Kumar (2001)[6] also suggested similar criteria for evaluation web resources. The present study made an attempt to collect comprehensive criteria from the available literature to evaluate web dictionaries of various science and social science subjects. The selected criteria for evaluation are: authority, copy right holder, domain, availability of graphics, quality of graphics, availability of references, date of publication, date of revision and hit counter.

Google search engine has been used to retrieve the dictionaries in science disciplines viz., Physics, Chemistry, Botany, Zoology and social science discipline viz., Political science, Economics, History, Sociology during July 2008. In order to retrieve relevant data from Google, the advance search features

of Google has been used. Since more number of sites are retrieved for each search query, it is decided to select and evaluate only first 20 sites. Only English pages were searched since the dictionaries in other languages were often difficult to assess for relevancy. Relevant dictionaries are checked against each selected criteria and data is presented in the following tables.

4. AVAILABILITY OF WEB DICTIONARIES

Table-1 clearly explains about the availability of total number of Web dictionaries in various disciplines of Science and Social Science. Total 6,04,500 Web sites are retrieved out of which only 160 (20 sites from each discipline) sites were selected for evaluation purpose. 68.75% (110 out of 160) sites are irrelevant and 27.5% (44 out of 160) of sites are relevant. Only a meagre percentage of sites (3.5%) show 'page can't be displayed'.

Table 1: Availability of Web Dictionary in various disciplines

Subject	Total Number of Sites	Selected Sites	Relevant Sites	Irrelevant Sites	Page can't be displayed
Physics	113000	20	8 (40)	11 (55)	1 (5)
Chemistry	63500	20	6 (30)	14 (70)	
Botany	11600	20	7 (35)	11 (55)	2 (10)
Zoology	4,900	20	6 (30)	14 (70)	
Sociology	119000	20	4 (20)	15 (75)	1 (5)
Political Science	600	20	1 (5)	19 (95)	
Economics	217000	20	7 (35)	12 (60)	1 (5)
History	74900	20	5 (25)	14 (70)	1 (5)
Total	604500	160	44 (27.5)	110 (68.75)	6 (3.75)

Note: Number given in parenthesis represents the percentage

Table 1 also demonstrates that fairly good number of relevant sites are found in Physics (40%) followed by Botany and Economics (35% each). Another major observation is that only one relevant web dictionary was found in case of Political science. From the above table it can be clearly observed that availability of web dictionaries varies from one subject to another. Overall 68.75% (110 out of 160) sites are irrelevant and 27.5% (44 out of 160) of sites are relevant.

5. COPYRIGHT HOLDER

Copyright is a unique property right that rewards authors for their contributions to the society and entices them to contribute to the advancement of knowledge. Copyright protects only the independently created words and arrangements of an author in relation to any idea. Every printed or electronic source will have copyright holder and Web based sources have no exception from it. Thus in the present study an attempt has been made to know the copyright holder of Web dictionaries and it is evident from the table-2 that 47.72% of web dictionaries have no copyright holder only 39.09% of them have author's copyright.

Table 2: Copyright Holder

Subjects	Copy right holder			
	Author	Publisher	Institute	None
Physics (n=8)	3 (37.5)	2 (25)	1 (12.5)	2 (25)
Chemistry (n=6)	2 (25)			4 (50)
Botany (n=7)	3 (37.5)	1 (12.5)	1 (12.5)	2 (25)
Zoology (n=6)	2 (25)			4 (50)
Sociology (n=4)	1 (12.5)			3 (37.5)
Political Science (n=1)	1 (12.5)	-	-	-
Economics (n=7)	2 (25)		2 (25)	3 (37.5)
History (n=5)	1 (12.5)	1 (12.5)		3 (37.5)
Total (n=44)	15 (39.09)	4 (9)	4 (9)	21 (47.72)

Note: Number given in parenthesis represents the percentage

6. DOMAIN NAME

Table 3 indicates the domain names of Web dictionaries of different subjects. It is found that 70.45% of sites belong to commercial domain. Meagre percentage of sites belongs to educational (18.18%) and 9.09% of web dictionaries have other domains. It is observed from the data presented in the table that more number of sites belongs to the commercial domain. Generally the Web resources are published and hosted by individual for commercial purpose, large number of commercial site are found in the study.

Table-3 Domain Name of Web Dictionary and Glossary

Subjects	Domain name					
	.com	.edu	.org	.net	.gov	others
Physics (n=8)	5 (62.5)	2 (25)				1 (12.5)
Chemistry (n=6)	4 (66.6)	1 (16.66)				1 (16.6)
Botany (n=7)	6 (88.71)					1 (14.28)
Zoology (n=6)	4 (66.66)	2 (33.33)				
Sociology (n=4)	2 (50)	1 (25)				1 (25)
Political Science (n=1)	1 (100)	-	-	-	-	-
Economics (n=7)	5 (71.42)	1 (14.25)		1 (14.28)		
History (n=5)	4 (80)	1 (20)				
Total (n=44)	31 (70.45)	8 (18.18)		1 (2.27)		4 (9.09)

Note: Number given in parenthesis represents the percentage

7. AVAILABILITY OF GRAPHICS

The structure and design of Web based sources significantly varies from the conventional printed source, because of multimedia system. In the electronic environment the multimedia system is changing the nature of reading itself. Instead of limiting to the simple presentation of text as printed in books, multimedia makes reading more dynamic by conveying meaning, words serve to expand the text in order to learn more about the topic with graphics, audio and video. It also enhances the interface between the user and the information. Keeping in view, the importance of multimedia in Web based

sources, in the study efforts are made to analyse the availability of graphics in the web dictionaries and the data are presented in the following table-4.

Table 4: Availability of Graphics

Subjects	Availability of Graphics	
	Yes	No
Physics (n=8)	4 (50)	4 (50)
Chemistry (n=6)	1 (16.66)	5 (83.33)
Botany (n=7)	3 (14.85)	4 (57.14)
Zoology (n=6)	2 (33.33)	4 (66.66)
Sociology (n=4)	1 (25)	3 (75)
Political Science (n=1)	-	1 (100)
Economics (n=7)	2 (28.57)	5 (71.42)
History (n=5)	2 (40)	3 (60)
Total (n=44)	15 (34.09)	29 (65.9)

Note: Number given in parenthesis represents the percentage

Graphics are visual data and they mainly include photographs, line drawings, computer generated artwork etc. Graphics play very important role in the presentation of data of any work. As computer graphics can be entered into the computer using scanners, drawing programs, cameras and graphic tablets, the Web resources can have more number of Graphics. It can be seen from the table-4 that 34.09% of sites have graphics and 65.9% of sites have no graphics.

8. QUALITY OF GRAPHICS

Availability of more number of graphics significantly effects on the loading time of the Web site and thus while designing a Web site one must keep in his mind that, a Web site must have less number of graphics and those should be most relevant and qualitative one. Qualitative graphics will increase the effectiveness and aesthetic features of the Web site.

Table 5. Quality of Graphics

Subjects	Quality of Graphics			
	Excellent	Good	Fair	Poor
Physics (n=4)	2 (50)	2 (50)		
Chemistry (n=1)			1 (100)	
Botany (n=3)				3 (100)
Zoology (n=2)			1 (50)	1 (50)
Sociology (n=1)				1 (100)
Political Science (n=0)	–			0
Economics (n=2)			1 (50)	1 (50)
History (n=2)				2 (100)
Total (n=15)	2 (13.33)	2 (13.33)	3 (20)	8 (53.33)

Note: Number given in parenthesis represents the percentage

The table 5 demonstrates the quality of graphics, which are rated on four-point scale: excellent, good, fair and poor. It is evident from the table that majority of sites are rated as poor (53.33%) and 20% of sites are rated as fair. In case of Physics comparatively good numbers of graphics were found.

Figure-1 & 2 [7] clearly shows the Eric Weisstein's web Physics dictionary home page and animated graphics respectively. The home of the dictionary includes information about the total number of entries, cross references, figures and animated graphics.

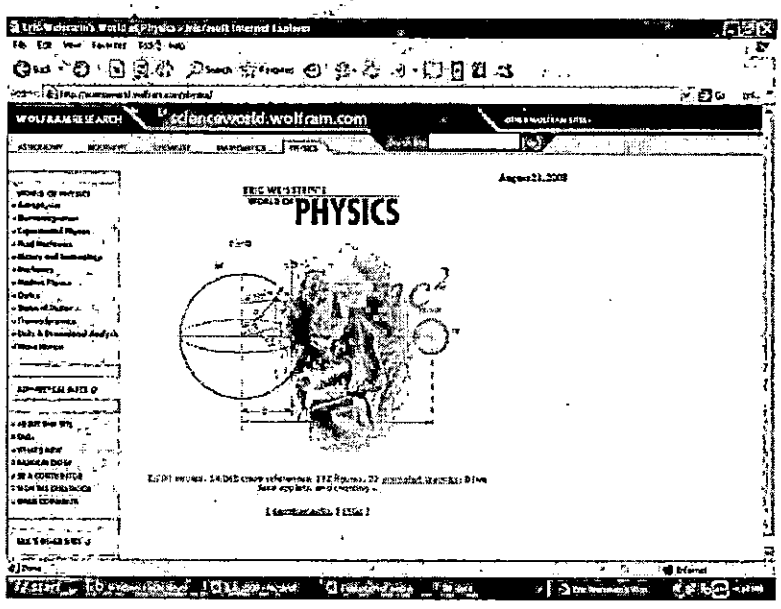


Fig.1. Eric Weisstein's Physics dictionary home page

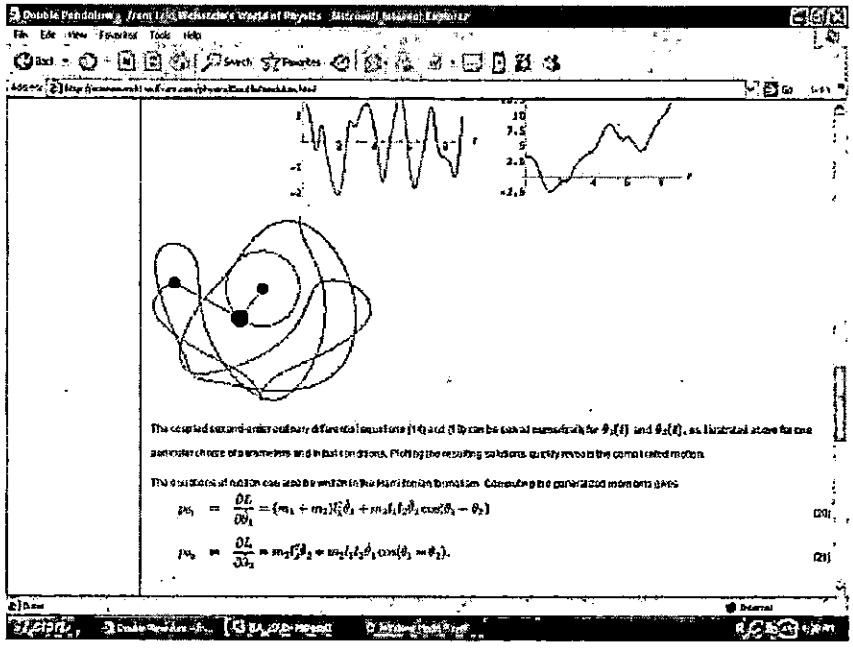


Fig.2. Animated graphics in Eric Weisstein's Physics dictionary

9. BIBLIOGRAPHY AND HIT COUNTER

Some times bibliography is useful to the target group to have more information regarding the specific topic if they are not satisfied with the existing source. Moreover in case of Web resources it is very essential and comparatively easy to provide bibliography or references in the source. In a single mouse click one can easily get connected with bibliography or references which are appended to source. It can be seen from the table-6 that 84.90% of web dictionaries have no bibliography or references for further reading and only 15.9% of web dictionaries have bibliography or references for further clarification.

The effectiveness of any source mainly depends upon its content. How many times the site has been used indicate the usefulness of the web site. For this purpose Web site may include a hit counter to show how many times the Web site has been used by the targeted user. In this regard an attempt has been made to assess the availability of hit counter in the home page of dictionaries. It is clear from the table-6 that 86.36% of web dictionaries have no hit counter and only 13.63% of web dictionaries have hit counter.

Table 6: Availability of Bibliography and Hit Counter

Subjects	Availability of Bibliography		Availability of Hit counter	
	Yes	No	Yes	No
Physics (n=8)	2 (25)	6 (75)	2 (25)	6 (75)
Chemistry (n=6)	1 (16.6)	5 (83.33)	2 (25)	4 (75)
Botany (n=7)	2 (28.57)	5 (71.42)	1 (14.25)	6 (85.71)
Zoology (n=6)	1 (16.66)	5 (83.33)		6 (100)
Sociology (n=4)		4 (100)		4 (100)
Political Science (n=1)		1 (100)		1 (100)
Economics (n=7)		7 (100)		7 (100)
History (n=5)	1 (20)	4 (80)	1 (20)	4 (80)
Total (n=44)	7 (15.9)	37 (84.90)	6 (13.63)	38 (86.36)

Note: Number given in parenthesis represents the percentage

10. DATE OF PUBLICATION & DATE OF REVISION

Every print or a web source should have date of publication and date of revision to know when the source has been published and revised. In the present study an attempt has been made to analyse how many web dictionaries have date of publication and date of revision. The data are presented in the table-7 and it is clear from the table that 86.36% and 77.27% of sites have no date of revision and date of publication respectively.

Table-7: Availability of Date of Publication & Date of revision

Subjects	Availability of date of publication		Availability of date of revision	
	Yes	No	Yes	No
Physics (n=8)	3 (37.5)	5 (62.5)	1 (12.5)	7 (87.5)
Chemistry (n=6)	2 (33.33)	4 (16.66)	1 (16.66)	5 (83.33)
Botany (n=7)	1 (14.28)	6 (85.71)	2 (28.57)	5 (71.42)
Zoology (n=6)	2 (33.33)	4 (66.66)	-	6 (100)
Sociology (n=4)		4 (100)	-	4 (100)
Political Science (n=1)		1 (100)	-	1 (100)
Economics (n=7)		7 (100)	1 (14.28)	6 (85.71)
History (n=5)	2 (40)	3 (60)	1 (20)	4 (80)
Total (n=44)	10 (22.72)	34 (77.27)	6 (13.63)	38 (86.36)

Note: Number given in parenthesis represents the percentage

11. RECOMMENDATIONS AND CONCLUSION

The Web has become an important medium for communication, recreation and information provision. It offers new opportunities for libraries to move from being mainly providers of information on demand for clients to the active dissemination of information through publishing on the Internet. Now-a-days many libraries are establishing home pages and they are providing subject gateways on the World Wide Web, some simply to be 'on the Internet' but some with a specific aim or client/ program focus. On the basis of the findings of the study results the authors suggest the following recommendations:

- It is found from the study that half of the web dictionaries have no copyright statement in their respective home pages. To help the users and also to judge the quality and relevance of the web dictionaries, it is recommended that as a part of main text, the extent of information that is to be provided in the Web source would include: name of author(s) or designer(s), affiliation, date of publication and address of the author(s) for further communication.
- In an electronic media, there is more provision to use more graphics. Study results shows that more than half of the web dictionaries have no graphics. It is also found from the study that more number of graphics available in the web dictionaries are rated as poor. While designing a Web site one should keep in mind that the quality of graphics should be excellent as much as possible. So that the aesthetic quality of the Web based sources can be enhanced.
- There is more provision to provide bibliography in an electronic media because with a single mouse click one gets connected to the other site from the original source. But, it is found from the present study that only very few sites have bibliography for further clarification. Thus a designer or creator of the Web resources should provide a comprehensive bibliography for further information to the users.
- Hit counter is mainly used to assess the number of times the Web site has been used by the user. As it is observed from the study that a meagre percent of Web resources have hit counter and thus it is recommended to provide a hit counter in the Web resources to know the effective use of the source.

- Only a few web dictionaries have date of publication and date of revision. The date of revision speaks about the currency of Web resources and thus, every source should provide the information regarding the date of last update. This is important, particularly for individuals citing the Web page as a source of information and it also lets users know the currency of information that they are using.

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Exploring the Deep Web For Attracting, Educating, and Serving Library Users

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Abstract: The Web and its many information sources in Web accessible databases have the potential for being the world's largest knowledge base, encompassing all kinds of business oriented and scientific areas. The "information glut" phenomenon is by now renowned but still too overburdening. Users of the World Wide Web (WWW) have become familiar with and, in most cases, dependent on the ability to conduct simple searches that rely on information in databases built from billions of web pages harvested from millions of HTTP servers around the world .Searching for information on the Internet is easy. Finding qualitative relevant information is hard. It is estimated that there are hundreds of thousands of information sources on the Web, including both the Surface Web and the Deep Web. Most of these sources have their own search capabilities. In order to alleviate ordinary users from the formidable task of identifying useful sources and search them individually, it is important to provide a unified access to these sources. This paper attempts to explain deep web or invisible web which can be extracted and provided to the library users.

Key words: Invisible web, Deep web, Search engine, Web 2.0.

1. INTRODUCTION

The World Wide Web has been considered as the largest digital library in recent years. People all over the world use the Web to find all sorts of information, from medical information to food recipes. The Web is inherently distributed and the data on the Web is stored in numerous sources. Often, these sources have their search capabilities. For example, many organizations, companies and universities have their own Web sites and most of them have their own search engines.

The information a particular user needs is frequently stored in multiple sources. For example, publications on a subject may be available in the sources of many publishers, universities and research labs. It is difficult for an ordinary user to identify all the sources him/herself and search each source separately to find all information he/she needs. Ad hoc and unsound use of search engines on the Internet is akin to searching for a needle in a haystack, with similar outcomes. Part of the problem stems of course from the abundance of Search Engines (SEs), their tendency to overload the user with information.

1.1 Web Search tools

The World Wide Web is not only vast, but it is growing at an enormous rate. Dealing with such huge quantities of information has been a challenge for both consumers and providers. On the one hand, services such as search engines, directories, portals, Subject gateways, Social Networking, have become crucial Web 2.0 tools for the end users. In an attempt to better meet user needs on the scale of the Web, researchers and product developers have working on agent-oriented technologies that can use more intelligence to assist users in their online activities by automating as many tasks as possible.

1.2 Nuts and bolts of Deep web

SEs can be of various types such as indices (crawlers), directories, and Meta-SEs (MSEs). They can be divided into categories such as coverage (general or specialized), domain, focus (public,

academic, commercial), etc. And in addition to a basic interface, they can have an advanced interface with an abundance of services, operators, filters, and so forth.

On the other hand, information and service providers have had to apply advanced techniques to manage issues of scale. Among other issues, typically this implies using a database to generate Web pages dynamically. Often, dynamically generated pages are accessible only through the use of an HTML form that invokes a Common Gateway Interaction (CGI) request to the Web server. CGI requests are often converted to database queries parameterized by information supplied by the end user through the supporting HTML form. Information available only through such CGI requests comprises a portion of what researchers sometimes call the "deep Web" or the "hidden Web". Unlike ordinary Web pages mapped to standard URL's, information in the hidden Web is not accessible through regular requests by merely specifying a URL and receiving the desired page in response. Perhaps the information requires client authentication by means of a user ID and password. Or maybe the information is hidden behind a firewall in an intranet only accessible from particular IP addresses. Other portions of the Web are "hidden" only in the sense that none of the major search engines indexes those pages. Most commonly, however, data in the hidden Web is stored in a database and is accessible by issuing queries guided by the HTML forms.

Huge set of databases make up the content of today's digital libraries and has been called collectively as the Deep Web. A commercial vendor, BrightPlanet.com, claims the size of the deep Web is 500 times greater than the "shallow Web". Regardless of the actual relative sizes, it is clear that an enormous amount of data exists outside the so-called "indexable Web". Users want and need better access to this information. From the information provider's point of view, this paradigm of using HTML forms to act as an interface to an underlying database provides better information management and a greater variety of ways to display information. From the user point of view, this paradigm increases flexibility and control over what data is retrieved and displayed in response to a specific query. As increasing numbers of digital libraries around the world make their databases available through protocols such as OAI or Z39.50 the problem arises of determining, for any given query, which of these databases are likely to contain information of interest to a world-wide population of potential users.

Certainly one goal must be to aid information seekers in identifying the digital libraries that are pertinent to their needs regardless of whether the desired resources are part of the visible web or the deep web. However, currently information seekers must rely on the search engines of the visible web to bring them to the search portals of these "Deep Web' databases, where they then must submit a new search that will (it is hoped) obtain results containing information that will satisfy their original need or desire. Today's searcher, therefore, must learn how to search and navigate not only the visible web search engines, but also the differing and often contradictory search mechanisms of the underlying Deep Web databases once those have been identified.

1.3 Exploring the Deep Web

The first challenge in exploiting the Deep Web is to decide which of these myriad databases is likely to contain the information that will meet the searcher's needs. Only then the challenges of how to mix, match, and combine one or more search engines for diverse digital libraries for any given inquiry will arrive. The Hidden Web comprises all information that resides in autonomous databases behind portals, and this data cannot be reached by traditional crawlers like Google. While this phenomenon is known for many years, the growing number of Web portals with dynamically generated content and frequently changing hyperlinks aggravates the problem.

1.3.1 Web Crawlers

A Web crawler is a program that downloads Web pages, commonly for a Web search engine or a Web cache. Roughly, a crawler starts off with an initial set of URLs in a queue, where all URLs to be retrieved are kept and prioritized. From this queue, the crawler gets a URL (in some order), downloads the page, extracts any URLs in the downloaded page, and puts the new URLs in the queue. This process is repeated until the crawler decides to stop, for any one of various reasons. Every page that is retrieved is given to a client that saves the pages, creates an index for the pages, or analyzes the content of the pages.

Crawlers are widely used today. Crawlers for the major search engines attempt to visit a significant portion of textual Web pages, in order to build content indexes. Other crawlers may also visit many pages, but may look only for certain types of information (e.g., email addresses). At the other end of the spectrum, personal crawlers that scan for pages of interest to a particular user, in order to build a fast access cache. Because the Web is gigantic and being constantly updated, the design of a good crawler poses many challenges. Web crawlers needs to address many important challenges. It is important for the crawler to carefully select the pages and to visit "important" pages first, so that the fraction of the Web that is visited (and kept up-to-date) is more meaningful. Once the crawler has downloaded a significant number of pages, it has to start *revisiting* the downloaded pages in order to detect changes and refresh the downloaded collection. Because Web pages are changing at very different rates, the crawler needs to carefully decide which pages to revisit and which pages to skip in order to achieve high "freshness" of pages. For example, if a certain page rarely changes, the crawler may want to revisit the page less often, in order to visit more frequently changing ones. Not all pages are necessarily of equal interest to a crawler's client. For instance, if the client is building a specialized database on a particular topic, then pages that refer to that topic are more important, and should be visited as early as possible. Similarly, a search engine may use the number of Web URLs that point to a page, the so-called backlink count, to rank user query results.

1.3.2 Improving Web Caching

A Web cache saves recently accessed Web pages, so that the next access to a page can be served locally. Caching pages reduces the number of remote accesses to minimize access delay and network bandwidth. Typically, a Web cache uses an LRU (least recently used) *page replacement policy*, but it may improve the *cache hit ratio* by estimating how often a page changes. For example, if a page was cached a day ago and if the page changes every hour on average, the system may safely discard that page, because the cached page is most probably obsolete.

1.3.3 Focused Crawlers: Advanced Tools For Deep Web

Keyword search supported virtually by all Web search engines is inadequate for building a search tool that encompasses multiple portals, say for a meta portal on a specific domain. The reason is that the words that appear in a simple keyword list of a user query cannot be easily mapped to the various fields of a portal's query form or the various input parameters of a Web service.

An automatic mapping is feasible only in the trivial case when the portal has a single input field that accepts a list of words. Likewise, advanced tools like focused crawlers , which aim to automatically *classify* crawled Web pages based on training data for one or more topics, are inevitably stopped at portal boundaries (unless a portal offers an explicit link collection in addition to the usual query form). For proceeding beyond the portal the focused crawler would have to automatically generate meaningful

words for the input parameters of the portal, and this has so far been perceived as too difficult for an automated tool.

1.3.4 Web 2.0 Tools For Exploring Deep Web

The first generation of the Internet or Web 1.0 saw content posted to the World Wide Web in a largely static format. The web was comprised of an ever increasing number of web sites, sharing a wealth of information in a variety of formats. As the Internet grew, and technology advanced, there is a transition from text only pages, to pages with text and images, to pages which included animation, audio, video and multimedia in a variety of formats. Although Web 1.0 grew to hundreds of millions of web sites, by 2003, most of these web sites shared a common design theory. More recently, with the evolution of Web 2.0, there is a shift in the design of the Internet. The Internet is changing from a static user dependant medium, to a dynamic user created environment.

Defining Web 2.0 and what it encompasses often reads more as a media release than a clear set of technologies, standards and applications. There is nevertheless a common set of terms or descriptors that are being used to discuss Web 2.0 developments that emphasise the social aspects of collaboration and contribution, as well as the richer user experiences attained through the contextualisation of information. It was RSS feeds that introduced many libraries to a practical application of this Web 2.0 concept; followed by blogs and wikis, and now tagging, social bookmaking. Social software tools are also being applied to teaching as higher education seeks new ways to connect with current and future generation of students, integrating digital delivery into course design. Activities such as blogging, podcasting, and wikis have slowly begun to replace the static nature of the Internet. Users are no longer just reading online content, or listening to online music; they are creating their own content and mixing their own songs, and then sharing it with everyone else on the web. In a nutshell, what is happening is that the Web is shifting from being a medium, in which information is transmitted and consumed, into being a platform, in which content is created, shared, remixed, repurposed, and passed along.

1.3.5 Methods for Exploring the Deep Web

Finding the content in the deep Web first involves finding websites or specific pages that provide access to the deep Web databases. There are two methods. The first is to specify a subject term and append 'database' to it at a general-purpose search engine. The second method is to use a directory of databases and/or specialized search engines, which are also called pathfinders. In both methods, users perform at least two searches. The first search identifies relevant databases and subsequent searches are directed to the selected databases. The number of searches depends on the number of databases selected. Typically, users will search the databases one at a time through different interfaces specific to the databases. Deep Web database directories identify and organize databases, often by grouping databases into subject categories. The directories can be searched and/or browsed, and users can link directly to specialized databases. Many of the databases are free, while some require registration and have a fee structure for access and/or resource acquisition.

1.4 Challenges Of Deep Web Sources

It is difficult to automatically determine if a web resource is a member of the surface web or the deep web. If a resource is indexed by a search engine, it is not necessarily a member of the surface web since the resource could have been found using the several deep web directories, instead of traditional crawling. If a search engine provides a backlink for a resource, one may assume that the

resource is in the surface web. Unfortunately, search engines do not always provide all backlinks to resources. Even if a backlink does exist, there is no way to determine if the resource providing the link is itself in the surface web without crawling the entire Web.

The concept of classifying search results by topic was pioneered by Yahoo! Directory search and is gaining importance as search becomes more relevant in day to day decisions. However, most of the work here has been in categorizing the surface web by topic. This classification poses a challenge while searching the deep web whereby two levels of categorization are required. The first level is to categorize sites into vertical topics (health, travel, automobiles, etc.) and sub-topics according to the nature of the content underlying their databases.

Several deep web directories are under development such as OAIster by the University of Michigan, INFOMINE at the University of California at Riverside and Direct Search by Gary Price to name a few. The second, more difficult, challenge is to categorize and map the information extracted from multiple deep web sources according to end-user needs. The first commercial deep Web tool was @1 from Personal Library Software (PLS), announced December 12th, 1996 in partnership with large content providers. According to a December 12th, 1996 press release, @1 started with 5.7 terabytes of content which was estimated to be 30 times the size of the nascent World Wide Web. PLS was acquired by AOL in 1998 and @1 was abandoned.

1.5 Strategies For Finding Information On The Deep Web

Present LIS Professionals expects their library users to use web resource with expertise. Some of the more savvy ones are now re-marketing themselves as freelance information professionals or online information brokers. But there are just as many free newsletters and mailing lists, sometimes compiled by information professionals, to keep updated on internet sources that the search engines may not always find. Following are a few strategies for deep web exploration.

- Move beyond keyword searching on Google;
- Read the Search tips or Help menus on search tools to discover the possibilities;
- Try alternative strategies for searching using Invisible Web sites when appropriate for example Direct Search - http://www.freepint.com/gary/direct.htm;
- Use Subject Directories such as Infomine, Academic Info Internet Public Library, Librarians' Index to the Internet etc.
- Think of the Invisible Web as part of the whole instead of separate;
- Apply concepts of Library and Information Science not Computer Science;
- Horizontal Searching—incorporate the Web as integral to a search strategy;
- Look for bibliographies that can then be incorporated into searches for books and journal articles;
- Follow citations onto the Web.

2. CONCLUSION

Librarians spend a lot of time using several search engines than just Google to find answers. But there's one more area LIS Professionals need to keep in mind when guiding library users through the research process...the Invisible Web or deep web. This is World Wide Web content that cannot be retrieved through most search engines. Many sources estimate that up to fifty percent of the information on the Internet is not indexed by search engines. The remaining fifty percent is still a lot of information.

Why worry about the rest? Because the fifty percent you can't find through traditional search engines is often very valuable and authoritative information. It may reside in databases which require passwords, or it may be transitory in nature, such as streaming news services, in which information still exists after the stream but isn't searchable, or it may be in a database driven application which creates the page afresh in response to a query, like some of the Census databases.

In recent years, the concept of the deep Web has helped people understand there is more than meets the eyes of their favorite search engine. Among the many resource collections in the deep Web are online library catalogs and licensed commercial resources or databases. Use of these resources is possible if someone first knows where and how to access the catalogs or databases and, in the case of the some commercial databases that are licensed for a particular set of users, if someone has authorization for access either within a library or via the Web.

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Information Retrieval Using Automated Library System and E-resources

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Abstract: With the rapid development of technology people now live in digital world. Information technology is currently taking center stage and transformed the whole world into a global village with a global economy, which is increasingly dependant on the creative management and distribution of information. The enormous advantages it has in easing the delivery of information around the world. The effectiveness of communication technology depends how well it provides its clients with information rapidly, economically and authentically. Application of ICT in libraries has become inevitable in an era of information explosion and widespread use of digital information resources. Effective application of ICT in libraries helps in performing their operations and services most efficiently. Library professionals should be aware of handling modern technology and electronic gadgets. This paper focus on the status of library automation, different software packages used for automation, use of e-resources and the extent of their use in library operations.

Keywords: e-resources, ICT, Library automation.

1. INTRODUCTION

Information is dynamic and unending resource that affects all disciplines and all walks of life. ICT has revolutionalised the field of library and information services. ICT has developed to such a stage that it has given access to information at fingertips. UNESCO defines Information Technology as The scientific, technological and engineering disciplines and the managerial techniques used in information handling and processing; their applications; computers and their interaction with men and machines and associated social, economic and cultural matters (Peltu,1982)1. In short ICT on LIS means as the application of computers and communication technologies to the acquisition, organization, storage, retrieval and dissemination of information process. Convergence of computer and communication technologies and their subsequent application to library and information activities has changed the philosophy of information from unitary to universal access.

ICT is a broad term that covers wide range of technologies. It is the convergence of computers, communication and microelectronic-based techniques. The technologies and devices like Radio, Telephone, Telegraph, Fax, TV, Telephone, Mobile phone, Internet, WWW, Email, LAN, ISDN, Videoconference and Satellite communication Techniques are major part of the ICT. With the help of LAN, CUSAT community easily shares the information. Telephone and other devices play important role in library services like SDI, Inter library loan, reference services, and online information retrieval.

ISDN has increased the capacity for data transmission which facilitated introduction of new services such as E-mail, Fax etc. Cheaper data storage media has increased the storage capacity of libraries.

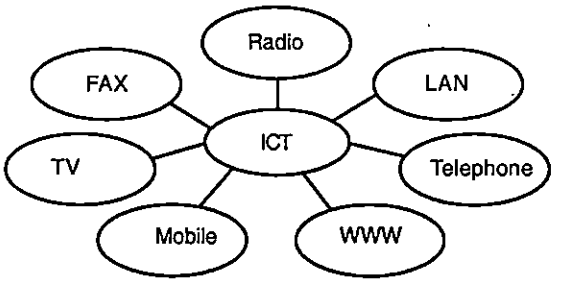


Fig.1 Components and Devices of ICT

The National Assessment and Accreditation Council (NAAC) is one of the premier Quality Assurance Agency (QAA), which is primarily addressing the issue of institutional quality assessment, and accreditation apart from the complementary and supporting services provided by the institutions. (Katre, Shakuntala, and Verghese, Mariamma A., 2007)..

In a complex information environment of triumphs and failures, and wide range speculations of the profession fading into oblivion, the mandatory standards of NAAC and quality indicators for the academic libraries have brought about a sea change in the attitude of library profession vis-à-vis professionals. Academic libraries have taken recourse to all the technological advancements necessary for gearing up their services. The managerial support of the institutions to their libraries, and their positive outlook, has moved the libraries from their ill defined corners to the forefront to accept new challenges. Effective application of ICT in libraries helps in performing their operations and services most efficiently. Library professionals should be aware of handling modern technology and electronic gadgets.

The aim of the study is to find out the impact of ICT on LIS and its major shifts and practices in university libraries, different software packages used for automation, use of e-resources and the extent of their use in library operations.

2. THE EFFECTS OF TECHNOLOGICAL REVOLUTION

The advent of new technology into the workplace and into society generally, can be very frightening for some people. The media and academia have contributed to the discussion as to why people are frightened of new technology, from dishwashers to computers, giving rise to expressions such as "technophobia", "cyberphobia", "computer anxiety" and "technostress" to describe such fears. The research of Rosen and Weil (2000) in the USA has explored human reactions to the introduction of additional technologies into the home and the workplace in recent years. They studied the responses of clerical and support staff, managers and executives in businesses across the USA and found that,although there are people who are genuinely excited by new technology and enjoy using it, there are a substantial number who are resistant to technology. Human fears of technology may emerge because of its introduction, or increase in use, appears to threaten the status quo. That could be a change in the routine at work that was happily undertaken for the past 20 years, or the fear of being left behind, or replaced by others who have the relevant technology skills. Change generally can bring both uncertainty and discomfort into our lives (Burton, 1992). It may provoke strong emotional reactions in people ranging from the confusion, fear and stress (Cooper, 1998) often associated with loss and bereavement. The effects of automation on library staff have been a focus of research for

the last 20 years and the introduction of automated library systems was a major point in the working lives of library staff since it involved learning new technologies, new processes and procedures. Years of routine were overturned instantly with the introduction of a computer for staff to work with. More recently, change might have involved moving to a more modern library management system or the acquisition of CDROMs and e-journals all of which might prove very intimidating for staff in libraries with little or no prior experience of such innovations (Hudson, 1999). Hudson argues that libraries generally are in a period of general uncertainty which can be worrying for staff and might provoke hostility or resistance to the introduction of new technologies.

3. TECHNOLOGICAL ATTITUDES

Attitudes – chiefly positive attitudes – are assumed to be fundamental in the acceptance, implementation and success of new technologies. Literature relating to people's views of technology is expressed in terms of attitudes to technology or attitudes to change. For ICT systems to be successful, it is suggested staff need positive attitudes to ICT. e resource is popular choice among readers who enjoy the ease of accessing news items, articles and short newsletters. The ease of delivery and production of email newsletters has led to the development of a massive number of available email newsletters, mailing lists and discussion lists on a large variety of topics. Newsletters are also widely used by media companies to complement their web and print offerings. Many authors and writers publish their own newsletters in order to attract new readers and to inform their fans about new books and book signings.

4. LIBRARY AUTOMATION AND INFORMATION CENTRES IN THE UNIVERSITY

The automation of Libraries is an important activity as it is a pre-requisite for networking of libraries and resource sharing. It enables promotion of e-Learning for remote users, usage of e-Journals/e-Books remotely, digitization of contents including non print materials, creation of Centre of Excellence in library, information and computer sciences, creation of e-Archives, creation of institutional repositories. Almost all the operations in a library can be automated to achieve more efficient and effective functioning and for providing excellent library and information services. ICT infrastructure would involve hardware, software, and telecommunication. Sufficient infrastructure is very essential for the successful application of ICT in libraries. The ability of computers to store and process vast amount of information coupled with the ability of communication technology to transmit this information from one location to another has revolutionized storage, retrieval, and dissemination of information in libraries. The value of ICT-based resources and services are that it can be easily shared, distributed, updated, manipulated, and rapidly searched. These resources are available in static physical forms such as CD-ROMs, or in a fluid form like the Internet. ICT awareness of library users is an important factor that enables them to become more effective end users. Training is an integral component of staff development and well-organized institutions have staff development as a central hub in their personal policies. Training on library automation and use of ICT-based resources and services are very important that enable the library professionals to provide value added services to their users. Training is suggested as an appropriate means of enabling staff to cope effectively with technological change. Successful training needs to appreciate that staff have different needs and so prefer different training methods.

Example: At Wipro Technologies, training is part of the profession. If any new technology is implemented, training will be provided to orient the library staff with system. Ex: LibsysX Software integration. When the database LibsysX was integrated for 8 Information Centers spread across India, all Wipro librarians were trained on the same, which helped in finding out due books/journals/ CDs against an employee from different locations across India.

Likewise Wipro's Information Center subscribes to ebrary (e-books) and Proquest, Emerald Insight and EBSCO categorized under e-resources. A monthly statistics of EBSCO site reveals that it is accessed 2750 numbers by Wipro employees. The usage to all electronic resources is quite high and well appreciated.

Harvard Manage Mentor is a just-in-time online learning courses on Coaching skills, Performance management, Budgeting etc. These online courses help managers to equip themselves with these skills whenever they need. They need not attend any class room sessions for the same, as they are offered thro intranet portals and Corporate gateway. ICT objectives include the provision of electronic access for users such that online access to library catalogues should be available and workstations for public use. In addition, every static service point is to provide public Internet access. To be able to provide this level of service the Standards require that qualified staff must have appropriate ICT qualifications.

The technological impact in terms of collection has moved from print to electronic resources in terms of journals, books etc. Services are started rendering in terms of databases and online search with shift from quantity to quality. Today's challenges and expectations from LIS professionals involve managing and providing access to digital sources, organizing and preserving the same in print and electronic form. In addition to it, cataloguing, internet resources, evaluating and selecting internet information resources, building subject gateways/ portal as a part of library portal. Ex: At Wipro Technologies, Information Services Division has exclusive intranet portal and all subscribed e-resources are listed. Wiproites can access the same through intranet and Wipro Gateway on need basis. These e-resources facilitate the employees to search/ access independently without relying on Librarians.

5. LIBRARY AUTOMATION SOFTWARE

NewGenLib, an Integrated Library Management System, is now freely available as open source under the most widely used free software license, GNU General Public License (GNU GPL) v3. Since becoming open source under GNU GPL, considerable interest has been shown in the software. Many libraries have reported downloading the software and are in the process of seeking help in data conversion, training, etc.

NewGenLib is the result of collaboration between specialists in library automation and software specialists. The software was developed over a 4-year joint effort between a professional charitable trust, Kesavan Institute of Information and Knowledge Management (KIIKM) and a fledgling software development company, Verus Solutions Pvt. Limited (VSPL), both in Hyderabad, India. Domain knowledge, functionality testing, initial promotion via presentations at professional meetings and assistance in preparing user documentation was provided by KIIKM. Software development was done by VSPL. The funding of the development and associated work was completely from individual/ private sources and one venture capitalist.

Before becoming an open source product at the end of 2007, it was already in use in 122 libraries, mainly in India but also including installations in Syria (3), Sudan and Cambodia. However, after

licensing the software commercially since 2003, KIIKM and VSPL decided that the software should be made open source for the following reasons:

The inadequate appreciation of the importance of investments in web-based library management and networking systems in India (and probably in other developing countries),

Library professionals in these countries still do not use web technologies to make a difference in services to their patrons, the need to bridge the divide between the older, resource-rich institutions (e.g., universities, R & D Center's) and recently established colleges, universities, public libraries, Libraries in India still do not generally use international metadata and interoperability standards (e.g., MARC-21, Dublin Core, OAI-PMH) and it is believed that this puts them at a great disadvantage when it comes to sharing metadata and building union catalogues and networking, and the fact that libraries are not networked and hence are handicapped in sharing costly bibliographic and full text resources among themselves, the importance of providing a software that would allow both library management and the creation of institutional open access repositories compliant with OAI-PMH to encourage the development of such repositories, License costs for contemporary web-based ILMS software is beyond the reach of many libraries. Ongoing support costs of commercially licensed ILMS are also high and this factor is a damper on libraries in India (and other developing countries) from using these even if they can afford the initial licensing costs, and to make available software that takes note of application environments and library practices typical of India and other developing countries.

KIIKM and VSPL felt that open source software would counter some of the above-mentioned gaps and therefore would attract many more users. For sustainability, moving away from a license-based business model to a service-based one probably seemed to make sense. KIIKM and VSPL are seeking funding to conduct workshops to build awareness of NewGenLib, and from higher education and research bodies to enable libraries to build networks, in India initially, that would enable easier and wider access to their resources for a broad spectrum of users.

6. CONCLUSION

We are living in an Information society demand for information is growing constantly and its value escalates in direct relation to that demand since the explosion in recent years of the World Wide Web and other electronic resources onto the information, the response is positively overwhelming by those who work with information resources. Research indicates that training has a positive role to play in acclimatizing people to the changes taking place around them. It can assist in the process of demystifying technology, although it is important to note that technophobes. The libraries and society in general through technological changes poses challenges for both staff and users of libraries particularly those new to using ICT. Electronic publishing or e resources uses new technology to deliver book and other content to students and readers, the technology allows publishers to get information to readers efficiently and quickly. It has become very popular technology in Information system today. A Library and Information Manager should familiarize himself with the emerging technologies mentioned above This technology is developing at a very fast rate and what looked impossible a few years back is becoming a reality now. The only thing we can be certain of is that there will be radical changes and in some instances there will be rapid.

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Integrated Search Solution to e-Resources: Implementation of ERMSS Software at Manipal University Health Science Library

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Abstract: In an environment where information technology makes remarkable progress and internet resources increase rapidly, ownership of information is not as important as access is. Library users in this new environment demand more sophisticated services not only with print materials that library holds but also e-resources such as e-journals, e-books, e-databases and web-resources. In order to meet the growing needs for integrating e-resources, Manipal University Health Sciences Library, Manipal adopted ERMSS (e-resources management and search solution) software. ERMSS software provides convenient and efficient interfaces to users and librarians by integrating subscribed e-journals, e-books, e-databases and open access resources. This paper goes into the details on the integrated e-resources management and search solution software, ERMSS.

Keywords: Internet, e-Resources, Web Resources, Literature Search, Integrated Search Solution, Health Sciences Library, Library Users, ERMSS.

1. INTRODUCTION

In the era of technology, the internet and the web play a crucial role in research that is being done by a student/researcher. Today, internet has become the back bone of the society. The emergency of the internet and the web has led to changes in the process of scholarly publishing, communication and to find the relevant information using internet. The primary objective of internet is to get the shortest and fastest way to the most relevant and updated information that one needs on any area that may be medicine, technology, business, information and knowledge management and on any other research area.

In the field of education and research, the resource center is the library. Library is a place where in all the resources i.e. books, journals, thesis, projects, etc. are stored. To overcome the drawbacks of the physical resources, libraries now have electronic/web resources, internet based subscribed resources, open access e-contents like e-books, e-journals and many more. A library just can't maintain a stock of the resources if it does not makes it available to the users. While performing a search on library website/portal, a user has to browse through multiple links to access e-resources available in the library. This consumes a precious time of the user which leads to lack of interest and under utilization of available/subscribed e-resources. Until and unless, the users reach their desired information which he/she is seeking without wasting his time, the e-resources available from the library portal are of no use to him/her.

2. E-RESOURCES MANAGEMENT AT THE LIBRARIES

The development of information technology and the dissemination of web environments have a dramatic effect on the user behaviors in information usage. The library user requests swifter and more convenient usage of information beyond the time and space barriers, which changes the library

atmosphere. The workflows from acquisitions to user services and the life cycle of electronic/web resources is quite different from that of print resources since it is characterized by access without holding the physical objects. Also, the functional responsibilities for managing e-resources are often distributed over departments such as serials, acquisitions and library systems. As licensing e-resources has greatly increased in recent years, libraries have struggled to control this information in paper files, integrated library systems, separate databases stored on local computers or network. Under these circumstances, the need to get a better handle on these resources has grown.

Management of e-resources has become more challenging and daunting task. As the library responds to the enormously increasing online resources and the users' rising demand for the resources, the acquisition, metadata organization and system management of e-resources become increasingly complicated due to more various types of publisher, and online interface provider, frequent changes in available journals and its issues within aggregated databases, and the variety in the scope of fair use for each license agreements.

3. NEED OF THE INTEGRATED SEARCH SOLUTION TO E-RESOURCES

The purpose of integrated search solution to the libraries is for meeting issues of the library management. There are many hurdles that are faced by the librarians in order to make the e-resources available to its users without wasting their time. Integrated search solution could help the libraries in greater way if the library has:

- multiple databases from various aggregators and publishers
- e-journals from various publishers
- e-books from various aggregators
- link to open access resources and other websites or search engines

Integrated search solution may cater to the specific needs of a library user. It provides easy access to e-resources subscribed by the library. It makes the task of the user simpler to access the multiple resources through a single window search interface. It also provides relevant and quick retrieval of information. Integrated search solution has listless advantages like the search results that are generated from it are more reliable. The user can access the e-resources from anywhere. The libraries can make optimum use of their e-resources.

4. MANIPAL UNIVERSITY, MANIPAL

Manipal is a coastal town in southwest India, about 150 meters above sea level and about 10 km from the Arabian Sea. The town is just 5 km from the temple town of Udupi and 60 km from the port city of Mangalore, Karnataka State. It nestles between the hill ranges of the Western Ghats and the blue waters of the Arabian Sea. The panoramic surroundings comprise of rural farmlands, gentle hills and inland waterways. It is only a 50 km drive to the rain forests of the Western Ghats.

Manipal University, Manipal, the destination for world class education since last 6 decades and the preferred education destination of students from over 52 countries. Manipal University is indeed a world, where global education meets world class infrastructure, facilities and dedicated faculty. It is amongst the first institutions in the private sector to be recognized as a Deemed University by the Government of India. It has over 20 constituent institutions that provide over 180 courses across 13 streams viz Medicine, Dentistry, Engineering, Nursing, Allied Health, Pharmacy, Life Sciences,

Management, Mass Communication, Information Sciences, Hotel Management, Regenerative Medicine, etc.

However, it all started with the vision of Dr. TMA Pai, who is regarded as one of the founders of modern India; and was facilitated with Padmashri and a commutative stamp by Govt. of India. The establishment of Kasturba Medical College, Manipal in 1953 set the platform for global education in India. This was followed by many flagship institutions, like Manipal Institute of Technology (MIT), Manipal College of Dental Sciences and many other world class institutions.

With just five professional colleges to start with, Manipal University has seen all-round development with diversified courses conducted through professional institutes. All the professional colleges of Manipal University have excellent track record and are reputed for their academic excellence due to its consistent and stringent emphasis on quality of education. In fact, Manipal University is recognized as the first ISO 9001:2000 certified university in India.

Manipal University currently has an enrollment of over 15000 students each year and has a strong alumni base of over 120,000 students worldwide. Today, Manipal has the largest concentration of foreign students in India doing professional courses, in effect the student body of Manipal represents 52 countries who live, work and study together.

Manipal University also boasts of the finest of the infrastructure and facilities in the areas of learning and research. In fact some of the facilities like the Innovation Centre - incubation centre for industry and research, Skills Lab, Anatomy Museums, Health Sciences Library are considered amongst the best in the world.

Besides Manipal University is compared with Nalanda of yore for its excellent academic reputation, experienced and dedicated faculty, outstanding clinical facilities and a world class environment that supports education. Some of the recent achievements of Manipal University Institutions are:

- Ranked 5th among the Best Medical Colleges of India
- Ranked 6th among the Best Engineering Colleges of India
- Ranked 4th among the best Pharmaceutical Sciences Colleges in India
- Ranked No.1 among the best Hotel Management Colleges of India

5. MANIPAL UNIVERSITY HEALTH SCIENCES LIBRARY

Manipal University has an excellent Health Sciences Library, perhaps the best among all Health Sciences Libraries in India. Begun with Kasturba Medical College, Manipal in 1953, Manipal University Health Sciences Library offers a rich array of information resources for pursuing discovery and research. The state of the art library stretching over 1.5 lakh square feet, on six floors is a domain for information seekers; be it students, faculty or researchers. It has the capacity to accommodate 1300 users at a time. The library is fully air-conditioned. The library is kept open from 8.30 a.m. to 11.30 p.m. on all week days. Besides comfortable seating and reading environment, library has the facilities like, internet kiosks, computer lab, e-learning lab, online library catalog (EPAC), Wi-Fi, study cubicles, group study area, private study area, audio-visual room, photocopying and fax.

The library has over 61000 books and subscribes to 645 print journals, 32200 back volumes of journals, 925 audio and visual cassettes, 500 CDs, 3500 theses, 2000 WHO publications, etc. A variety of e-resources, including 8 online databases, more than 2500 online journals and e-books

can be accessed from computers in the library on campus network. The library is subscribing to the following online databases:

- CINAHL Plus with Full Text
- Cochrane Library Online
- IDIS – Iowa Drug Information Service
- MD Consult
- Net Anatomy Educational Website
- OvidSP
- ProQuest Medical Library
- ScienceDirect (Health Sciences)
- SciFinder Scholar

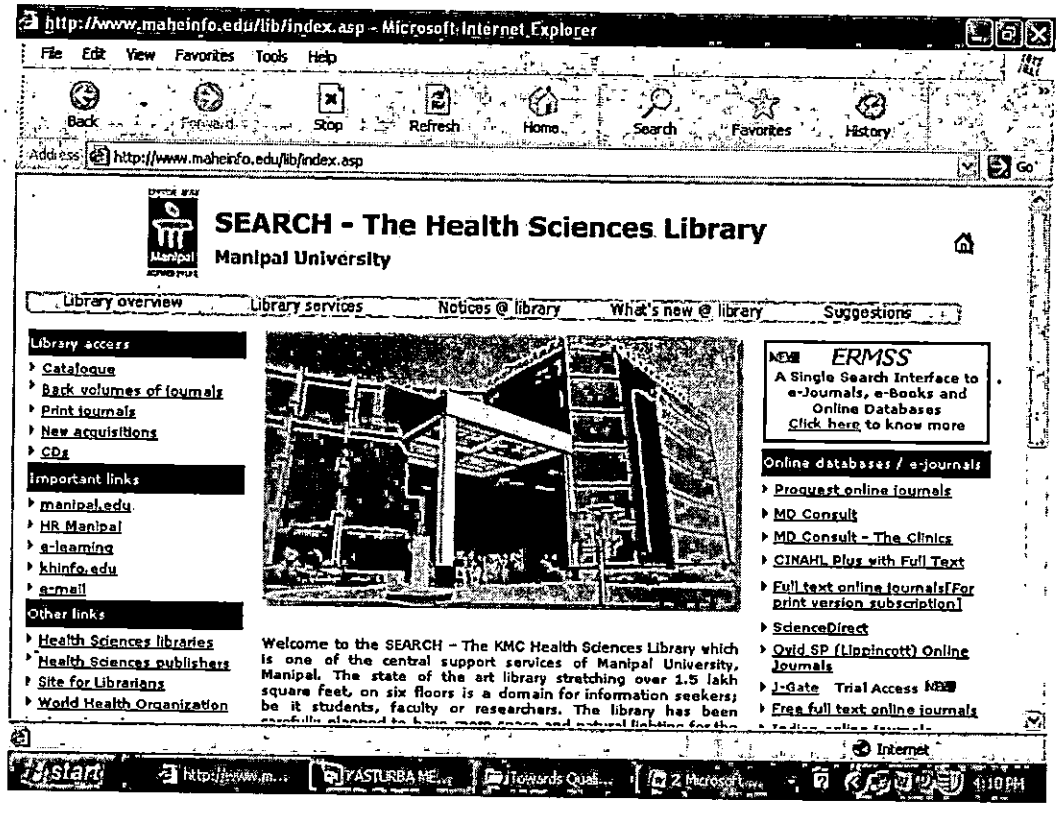


Fig.1: Home page of Health Sciences Library intranet web page

The Health Sciences Library is committed to provide a world-class information support to its users. The collection of the Health Sciences Library in the area of medical sciences, dental sciences, nursing sciences, pharmaceutical sciences, allied health sciences and life sciences is very strong. The collection is heavily used by the faculty, students and research scholars. The library has an international examination resource centre that helps the students to take several competitive examinations that are

held both in India and abroad. The library has a web page and users can browse e-journals, e-books and online databases and other e-resources in intranet environment in the campus.

6. BACKGROUND OF IMPLEMENTATION OF INTEGRATED SEARCH SOLUTION SOFTWARE

Health Sciences Library has access to plenty of e-resources and while performing a search on library website/portal, a user has to browse through multiple links to access e-resources available in the library. There was no integrated search solution to all the e-resources available in the library. To overcome this situation, Health Sciences Library of Manipal University has approached the M/s Total I.T. Solution Pvt. Ltd., New Delhi in the beginning of the year 2008. M/s Total I.T. Solution Pvt. Ltd. has an integrated e-resources management and search solution software, i.e. ERMSS. Mr. Rajiv Kumar Mishra, Managing Director, M/s Total I.T. Solutions Pvt. Ltd., New Delhi has visited the Manipal University Health Sciences Library on 6th of January, 2008 and demonstrated ERMSS software to the library professionals.

7. ABOUT THE ERMSS SOFTWARE

ERMSS (e-Resources Management and Search Solution) software is a customized e-resources management and search solution to manage and provide search on subscribed e-resources and open access resources. The scope of the ERMSS is to make available all e-resources of the library to its end-users.

ERMSS is a comprehensive search solution which has parameterized search functionalities. It can perform search on titles of e-resources (e-journals, e-books and online databases) integrated with the solutions which provides integrated and mapped results from e-resources. User can access the e-resources and their content from anywhere anyplace in the campus through intranet. This solution provides the linking of all the titles of e-resources (e-journals, e-books and online databases) subscribed by the library as well as open access resources. In this solution A-Z listing has been done for all e-resources.

ERMSS is built on highly scalable and flexible technology platform. This solution is backed by online help for the entire user. Online help provides the complete information to use the software. Some important features of this software are as follows:

- Quick retrieval of information
- An easy to use tool to search the e-resources subscribed and available in the library
- Integrated solution for linking of all e-resources subscribed by the library as well as other e-resources available free on the web
- Access to multiple e-resources through a single window search interface
- Customized solutions for the management and access of titles of e-resources
- A-Z listing of all e-resources (subject wise, resource type, publisher wise, publisher and subject wise listing)
- Can be customized with the website of library/institution including logos, header, footer
- Integration with library existing web portal and web OPAC also
- Each user can create own e-library for future reference

- Enables access to favorites or specific information on specific subject areas of a user
- Search can be performed among the interested subject as can be found in the user library
- Search platform for accessing all the subscribed e-resources through a single window interface
- Users can search on a single e-resource and on multiple e-resources at the same time
- Parametric, boolean and advanced search facilities
- User statistics facility to help librarian to take future decisions
- Authentication/access control. Multiples authentication option includes IP access for institution and single user authentication for individual access
- Link to other websites or search engines
- User can make optimum use of e-resources subscribed by the library and the open access resources

8. IMPLEMENTATION OF ERMSS SOFTWARE

Process of implementing the ERMSS software at the Manipal University Health Sciences Library started in the month of March, 2008 by the M/s Total I.T. Solutions Pvt. Ltd., New Delhi and completed the implementation process of ERMSS in the month of June, 2008. Health Sciences Library has provided both subscribed e-resources and open access (free) resources for integration in the ERMSS software as shown in the table 1, 2, 3. Details of total number of e-resources [e-databases (both subscribed and open access), e-journals, e-books and reviews] integrated in the ERMSS software at the Health Sciences Library is shown in the table 4.

Table 1: Subscribed e-resources of the Health Sciences Library

Names of the online databases	*No. of e-journals available*	*No. of e-books available*
CINAHL Plus with Full Text	568	98
Cochrane Library Online	3264 (reviews)	-
IDIS/Web (Iowa Drug Information Service)	341	-
MD Consult	89	51
Online Journals of Various Publishers (BMJ, Cambridge, Highwire Press, Informa Health Care, Ingenta Connect, JAMA and Archives, John Wiley, Karger, Oxford, Quintessence, Sage, Springer, Taylor and Francis, Theime, Wiley-Blackwell, etc.)	245	-
OvidSP	58	-
ProQuest Medical Library	978	-
ScienceDirect (Health Sciences)	269	-

Table 2. Open access (free) resources

Names of the open access (free) e-resources	No. of e-journals available	No. of e-books available
Bioline International	59	-
BioMed Central	205	-
DOAJ – Directory of Open Access Journals	433	-
Free Medical Journals	339	-
FreeBooks4Doctors	-	480
MedIND	41	-
Medknow Journals	62	-
PLoS	7	- 0
Priory Medical Journals	12	-
PubMed Central	463	-

Table 3. Link to other web sites

Names of the web sites
DELNET Online
Library Online Catalog (EPAC)
Medline Plus
Net Anatomy Educational Website
PubMed/MEDLINE
Search Engines

Table 4. Total number of e-resources integrated in the ERMSS software at the Health Sciences Library

Description	*Total no. of e-resources integrated in the ERMSS*
Online databases (subscribed and open access)	18
e-Journals	4169
e-Books	629
Cochrane library reviews	3264
Link to other web sites	6

8.1 ERMSS Modules

ERMSS is a web-based integrated electronic resources management system which supports not only subscription information and metadata management, but also supports meta-search, linking and linking functions. ERMSS software is composed of the following modules at the Health Sciences Library.

Home | About ERMSS | A-Z e-Resources | e-Journals | e-Books | e-Databases | Publishers Index| Search Options | EPAC | Search Engines | e-Mail Alerts | My e-Library | Feed Back | Help | Admin Login |

With the above modules, ERMSS can manage the following formats of information:

- e-Journals, e-books and e-databases having institutional subscription
- Open access resources/journals archives at the internet

- Print resources (books, journals, back volumes of journals, WHO publications, etc.) of the Health Sciences Library
- Link to other websites, bibliographic database, search engines
- Online help to users to use the ERMSS software
- Administration panel services like resource management (add/modify/edit/delete any e-resources), category management (add/modify/edit/delete any subjects), usage statistics (e-resources/ databases), etc.

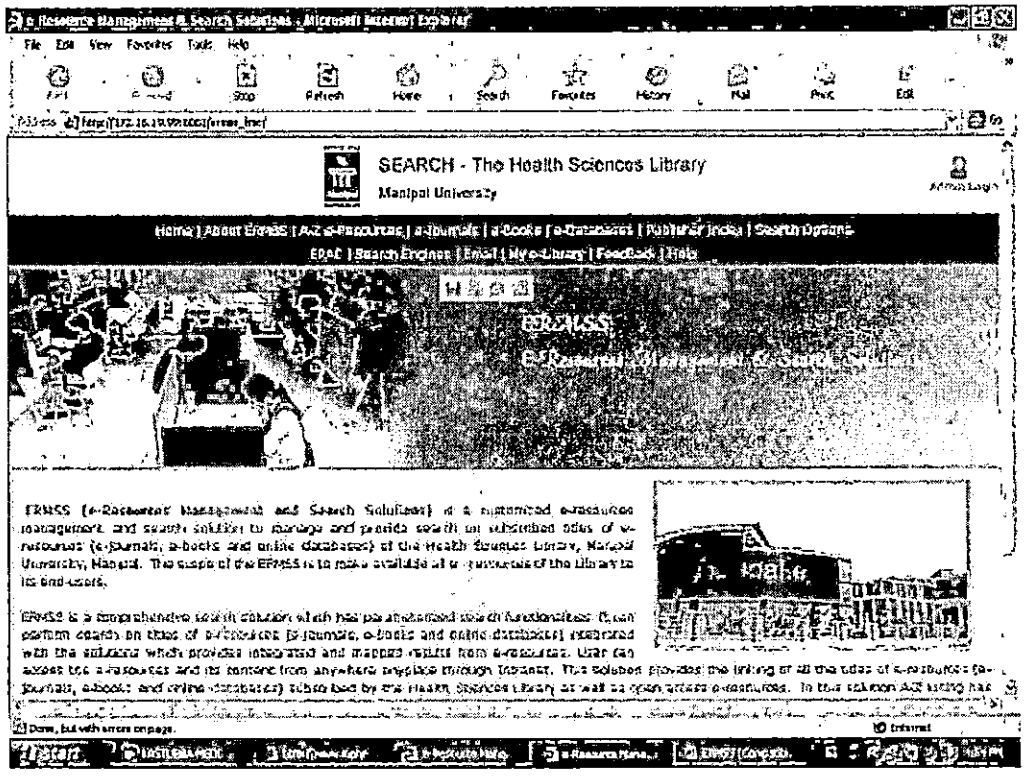


Fig.2: Home page of ERMSS software implemented at the Health Sciences Library

9. HOW ERMSS SOFTWARE WORKS?

Functions of ERMSS software could be divided under the following two categories:

- User panel services
- Administration panel services

9.1 User Panel Services

ERMSS solution provides the linking of all the titles of the e-resources subscribed by the library and open access resources. It is useful for the library users and all knowledge seekers. They can easily view, access and search within all the e-resource contents with the same interface. User site of

ERMSS is comprised of various user panes services. Following are the complete view of the functioning of each icon of the user panel services of the ERMSS.

9.1 .1 A-Z e-Resources

All the integrated e-resources are alphabetically arranged here. Listing of the e-resources has been provided by three parameters: Title Listing, Publisher Listing and Subject Listing. By clicking on "A-Z e-Resources", it shows/displays the alphabetical list of all the e-resources such as e-journals, e-books and cochrane library reviews. All the e-resources are symbolized differently: e-journals, e-books, cochrane library reviews.

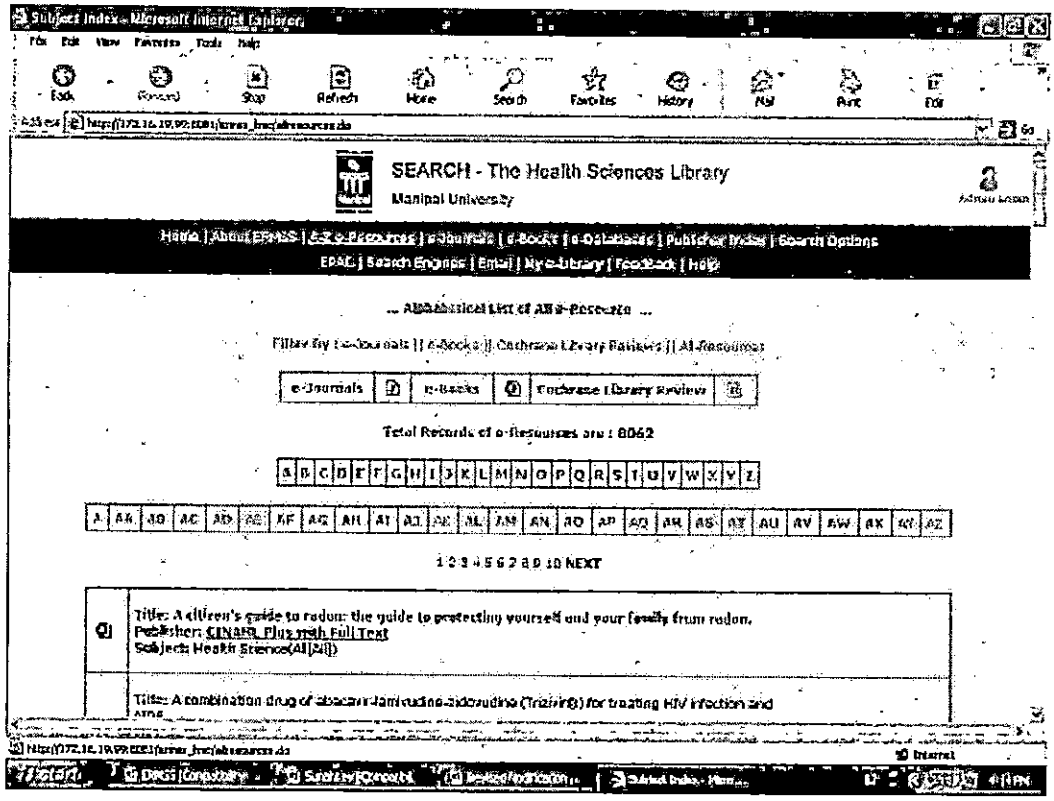


Fig. 3: A-Z e-resources

9.1.2 e-Journals

This provides the alphabetical list of e-journals and the search result is displayed: Title wise, Publisher wise and Subject wise.

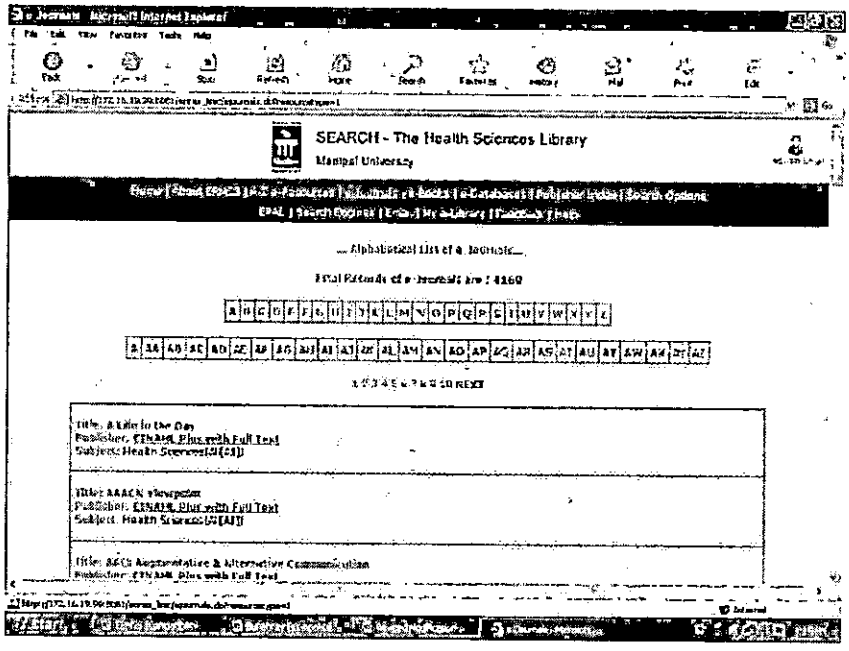


Fig.4: e-Journals

9.1.3 e-Books

This icon provides the alphabetical list of e-books and the search result is displayed: Title wise, Publisher wise and Subject wise.

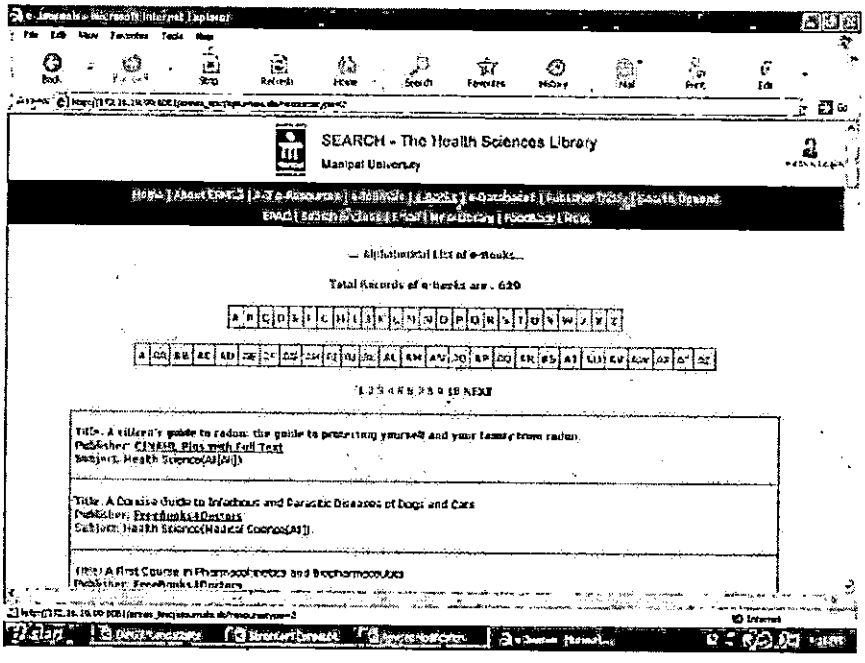


Fig.5: e-Books

9.1.4 e-Databases

This provides the alphabetical list of subscribed databases such as CINAHL Plus with Full Text, Cochrane Library Online, DELNET Online, IDIS - Iowa drug information service, MD Consult, Net Anatomy Educational Website, OvidSP, ProQuest Medical Library, PubMed/Medline, ScienceDirect and open access databases such as Bioline International, BioMed Central, DOAJ – Directory of open access journals, Free Books 4 Doctors, Free Medical Journals, MedIND, Medknow Journals, Medline Plus, PLoS, Priory Medical Journals, PubMed Central.

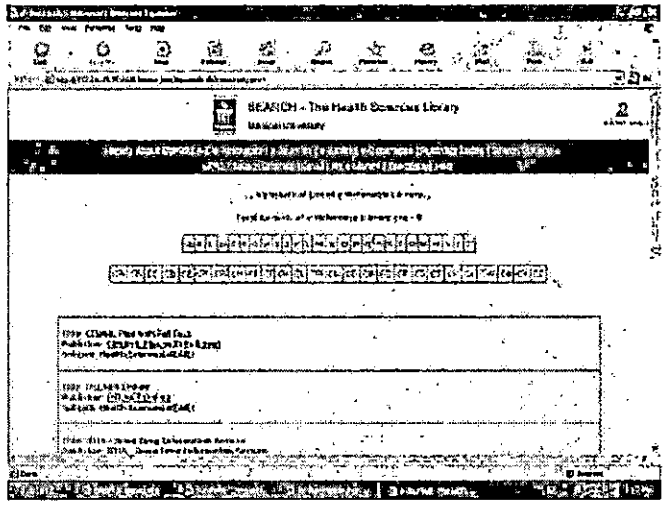


Fig.6: e-Databases

9.1.5 Publishers Index

This icon provides the alphabetical listing of all the publishers. Some of them are American Medical Association, BMJ, HighWire Press, Informa Healthcare, Ingenta Conect, John Wiley, Karger, Quintessence, Sage, Springer, Thieme, Wiley-Blackwell, etc.

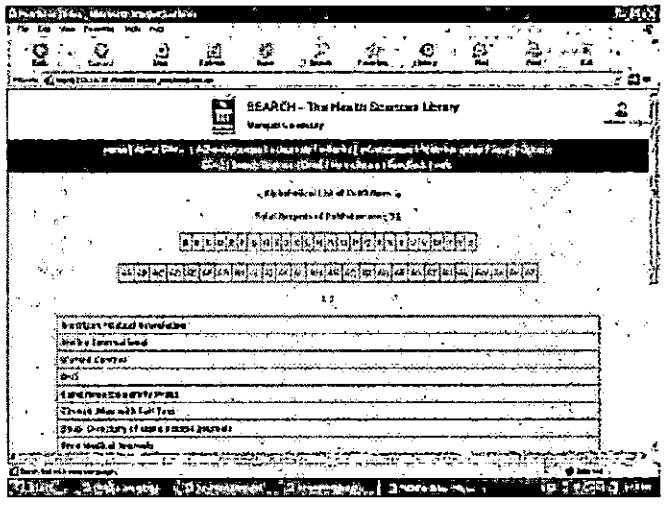


Fig.7: Publishers Index

9.1.6 Search Options (Basic, Subject and Advanced)

Basic Search provides link to full text of e-journals, e-books and online databases. User can search information in fields like journal title, publisher, subject category, etc. User can search on a single search field or multiple search parameters.

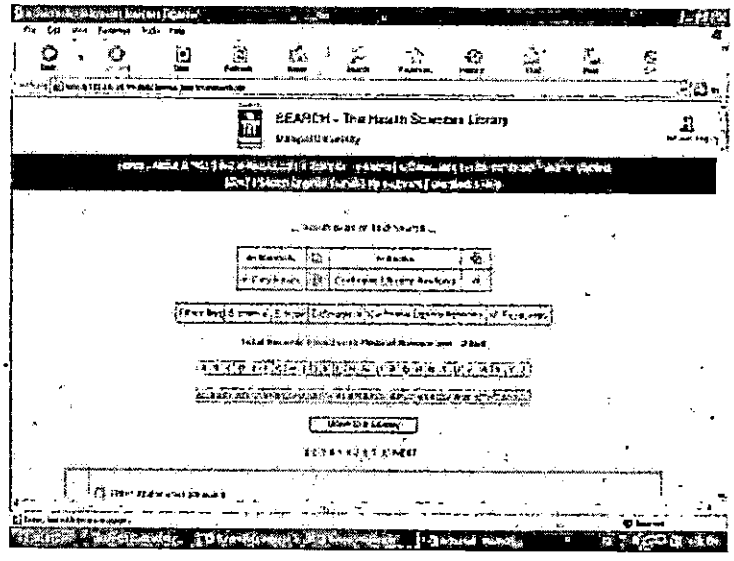


Fig.8: Basic Search

Subject Search facility enables single window search to all e-resources available through ERMSS. Here user can find information about a specific field/subject on a single window itself rather than visiting hundreds of e-journals, e-books and online databases subscribed by the library.

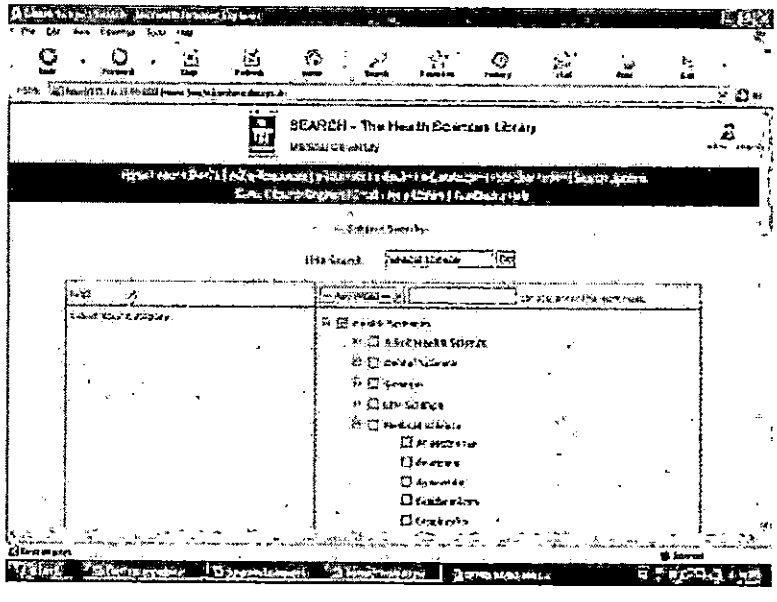


Fig.9: Subject search

Advanced Search is basically boolean search. Users can search on others fields apart from having all search facility included in basic search.

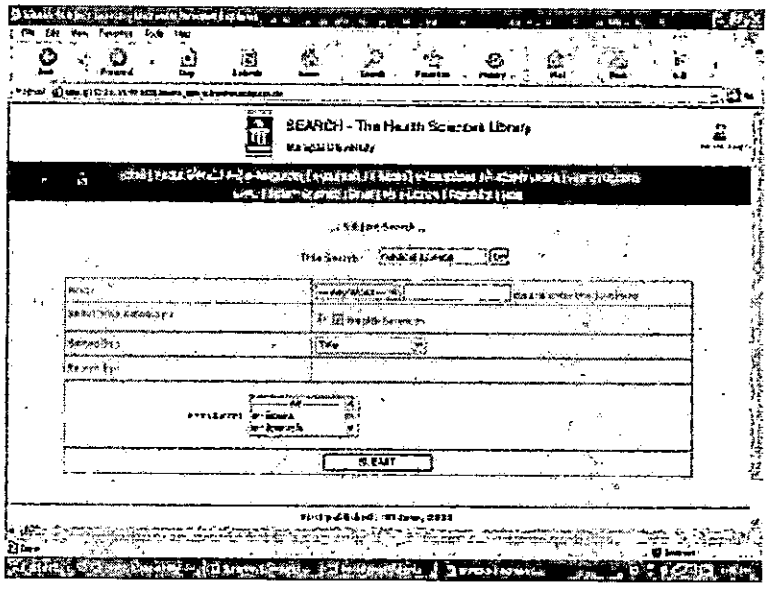


Fig.10: Advanced search

9.1.7 EPAC

This is Electronic Public Access Catalogue of Health Sciences Library. Users can search all the print resources (books, journals, back volumes of journals, dissertations, WHO publications, etc.) of the Health Sciences Library here.

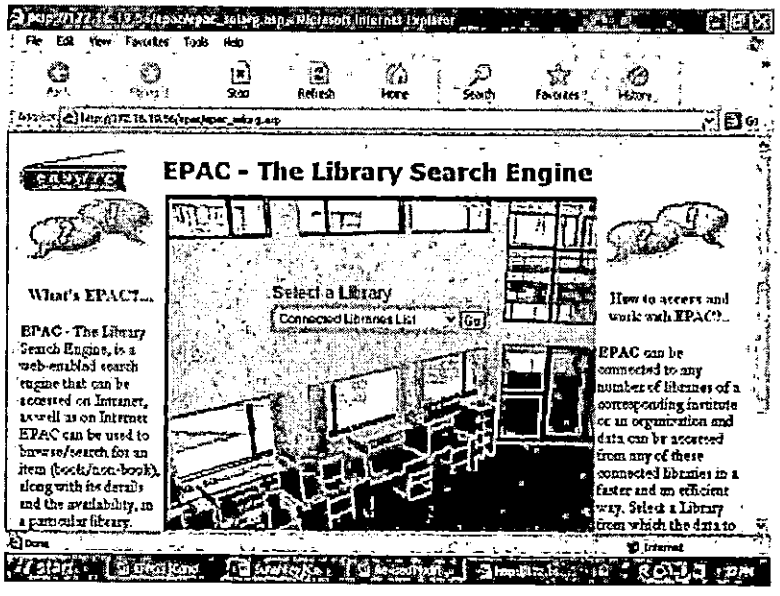


Fig.11: EPAC

9.1.8 My e-Library

Here each user can create own e-library for future reference. It is like an email account, wherein a user can maintain his/her own library by saving the search results of the resources which can be used in future. This would mean that user can maintain their self and can place information in it. For this purpose, they get an ID. So, their material is safe. e-Library is same as any other account on the web.

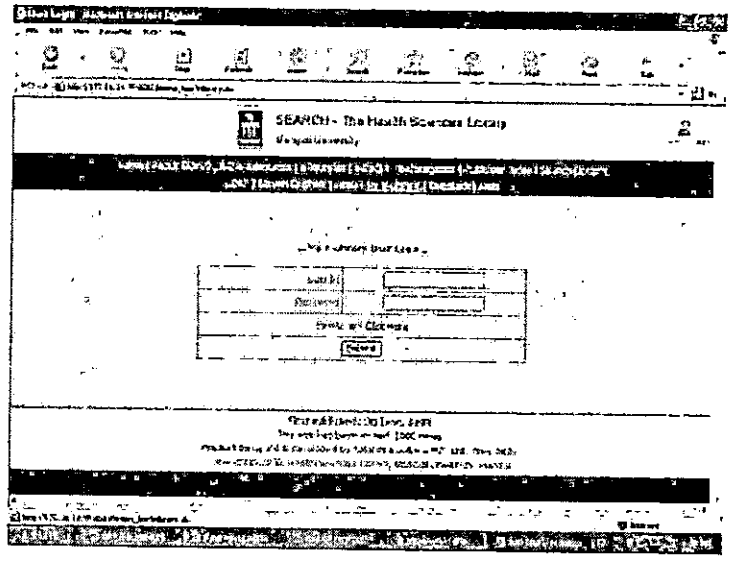


Fig. 12. My e-library

9.1.9 Feedback

Feedback form can be filled by the user for giving suggestions, etc. to the Health Sciences Library regarding the access of e-resources using ERMSS software.

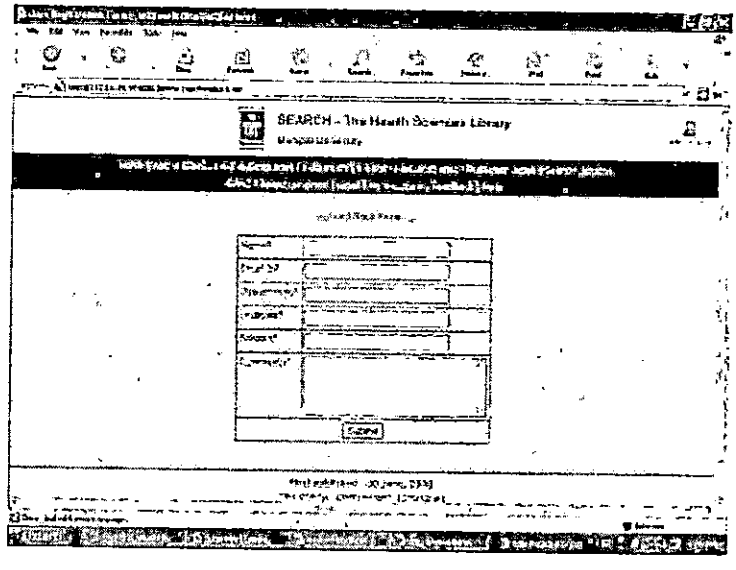


Fig. 13. Feedback

9.1.10 e-Mail Alerts

This is the facility which is given to the registered users. For availing this facility, first the user needs to get registered through the e-mail alert form. After getting registered, users would be able to receive all types of insertions, updations and deletions done by the administrator/librarian.

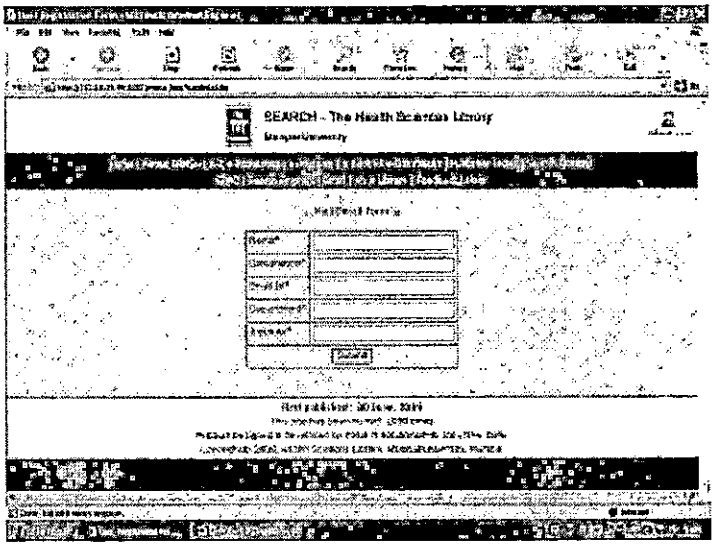


Fig. 14. e-Mail alerts

9.2 Administration Panel Services

Admin site of ERMSS is comprised of various administration panel services. Following are the complete view of the functioning of each icon of the administration panel services of the ERMSS.

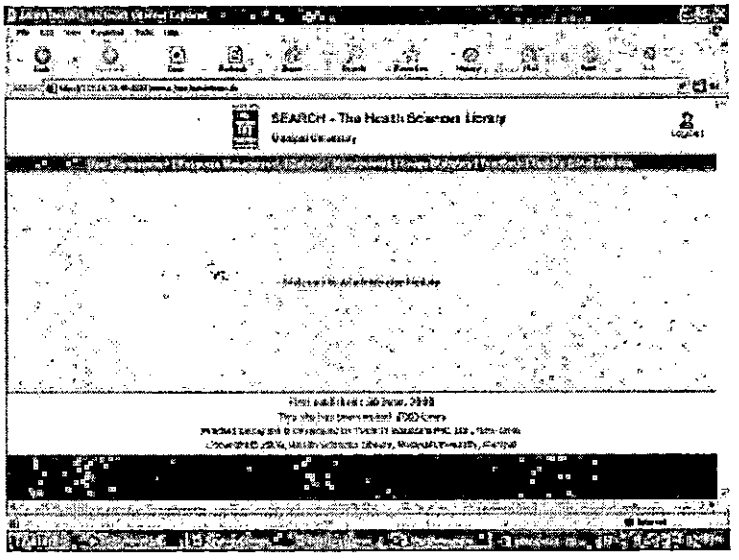


Fig.15: Administration Panel Services

9.2.1 User Management

User management is used to fix the authority level of administrators/librarians. This part is composed of user group management which gives the same authority to certain user group, menu management for each user group and user management to give special authority to some persons.

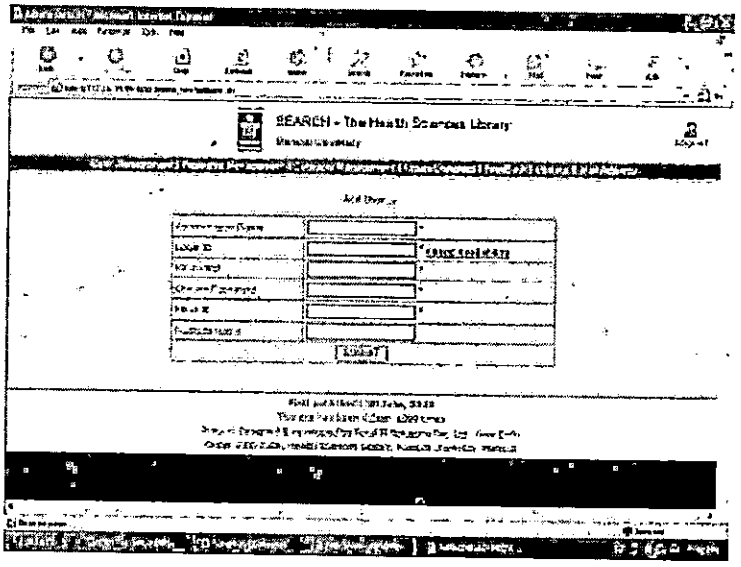


Fig.16: User management

9.2.2 Resource Management – Add Resources

This is basically used by administrator/librarian to add resource whether it could be an e-journal, e-book, e-database or any other e-resource respectively with its details.

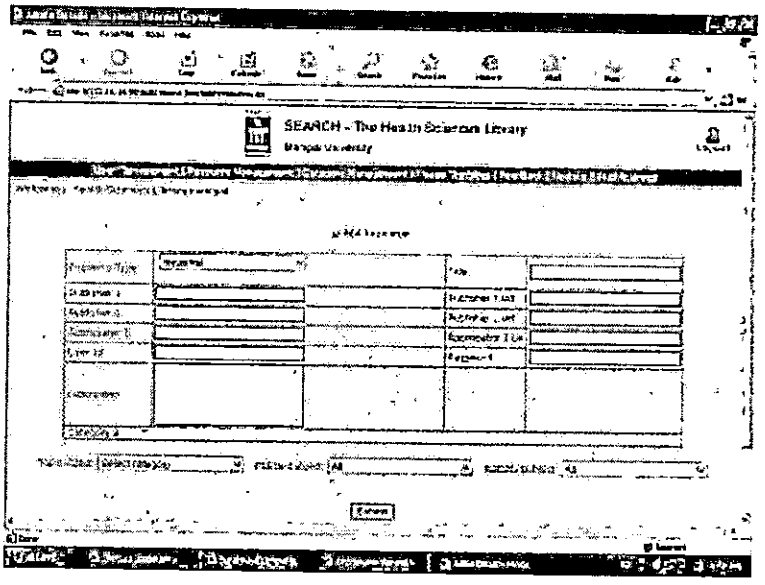


Fig. 17. Add resources

9.2.3 Resource Management – Modify Resources

This is used for by administrator/librarian to modify the details of the resources for the respective e-journal, e-book or e-database. Through this, the administrator/librarian can easily edit the details as well as delete it.

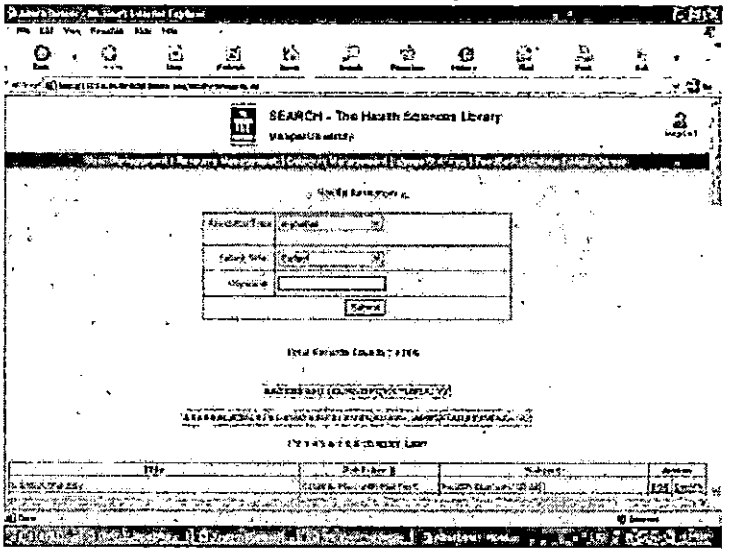


Fig.18: Modify Resources

9.2.4 Category Management

This is used for by administrator/librarian to add, modify or delete subjects at top category, middle category and bottom category.

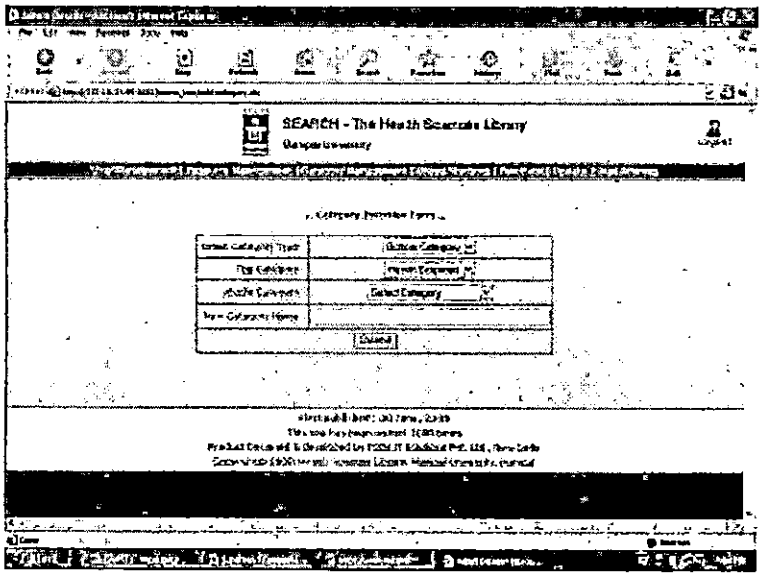


Fig.19: Category Management

9.2.5 Usage Statistics

Here administrator/librarian can see the usage statistics reports for each e-journal, e-book, e-database and publisher. Usage statistics facility is helping theadministrator/ librarian to take future decisions.

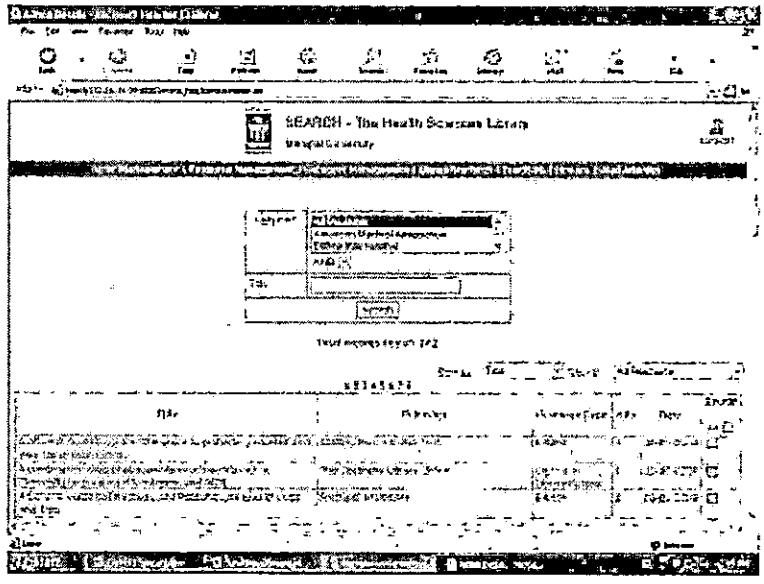


Fig.20: Usage Statistics

10. CONCLUSION

ERMSS is an effective management and search tool for the information seekers like faculty members, researchers and students. One can access one or all the e-resources (e-journals, e-books and online databases) in the same interface by using various search parameters. When a user makes a request in the software, it would look for the answer in all the e-resources be it online databases, e-books, e-journals and open access resources. The user will then get the appropriate answer to his/her request made. It manages the content under the pool of resources and provides desired search results.

ERMSS facilitates large libraries in achieving maximum usage of the e-resources available. And, also provide comprehensive management and single search solutions enabling quick and relevant access of internet based subscribed e-resources along with digitized contents of an institution, internet based open access contents, physical resources of the library. ERMSS minimizes the crowd at library and provides edge to the library user and library management team. It is a fully customizable product which can be made as per the requirements of the library. It can be integrated with any library which has e-content/e-resources and internet connection.

ERMSS could help the libraries in greater way. It maintains a sound management system that will ensure effective operating, policy and planning decision. It provides cost effective acquisition and retrieval of resources and maintains a sound financial base for library collections, services and personnel. By implementing the ERMSS software, Manipal University Health Sciences Library is keeping pace with the changing technology, thereby providing the users the convenient and efficient interfaces to access e-resources available in the library.

REFERENCES

1] ERMSS: e-Resources Management and Search Solutions. M/s Total I.T. Solutions Pvt. Ltd., New Delhi. www.totalit.co.in

2] Manipal University, Manipal. www.manipal.edu

Knowledge for All: Opportunities and Challenges for Visually Handicapped People in India for Higher Education

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Abstract: In this paper the author tried to analyze the need for a centralized resource center for visually handicapped in India. The article gives information about the main organization In India helping visually impaired for their education. The author gives details of some of technologies and the barriers to access them. The paper also talks about legislation and the need for a better legislation in India as par with other countries. Technology is a boon for visually handicapped in India. The people who are handling them should be trained and should utilize the maximum resource available so that a visually impaired won't be a burden to the society. The author wanted to explore the challenges and opportunities of Braille Libraries in India that faces in this Digital Age.

Key words: Braille Libraries, Assistive technology, Web resources, knowledge, Visually Handicapped

1. INTRODUCTION

In this digital age, No Library can boast that they are self sufficient. Each Library has to collaborate and has to share its own resources to satisfy the ever increasing needs of the users. The academic libraries generally cater to the needs of its students and their faculty. The authorities turning their back in providing library services to fulfill the needs of special people who are disabled, challenged by vision, and hearing loss. Because of rising prices in purchasing books and periodicals it is very difficult to develop each and every library some collection for the special categories. The special categories needs are just like that of general category. Their need varies from leisure to academic. For accessing the information hearing and visually impaired requires information on accessible format. They also require assistive and adaptive technology. If any library wants to procure all these along with Braille books, Special equipments then the amount for purchasing will pinch the libraries other activities. The library also needs special rooms for allowing the reader to read for visually challenged people.

2. ACCESS TO INFORMATION

Access to information is major problem for print disabled in India. The visually impaired in India till today depend on two primary sources for their information. One is Braille Books and the other is talking book service. But today ICT has helped to reduce the digital divide between sighted and the blind by providing information on their desktop. ICT and its tools are highly flexible and provide great scope for usage by persons with vision impairment. Information available to the seeing world is now available to the persons with vision impairment. It is very evident that those who are computer literate are able to gain education, and empowerment as compared non literate in technology. Still with all these technologies the vision impaired has facing problems in accessing the information.

3. KNOWLEDGE MANAGEMENT

Knowledge management generally refers that managing knowledge as an asset. Knowledge management comprises practice by an institution to identify create, distribute and store the knowledge

for the future. Knowledge management is associated with information technology and the human resource management.

3.1 Knowledge Management For The Blind And Visually Handicapped In India

There are many objectives for a knowledge management system. If we analyze the need for information for visually handicapped which usually ranges from leisure to academic. The need for information for a blind is similar to that of sighted person. Only difference is that the blind requires information in alternative format which they can access easily with the help of technology. In the past the blind depend only on Braille documents. Their reading for the books other than available in Braille format mainly depend on charity. i.e. someone voluntarily read for them. Later with the advent of technology the blind could access each & every piece of information published in this world through assistive and adaptive technology.

3.2 Create Knowledge Repositories

Many a times it is observed that the information available to the blind or visually handicapped is made by in-house and circulated among the members of the organization. It creates duplication of the work. Lots of money is going waste. Today through the knowledge repositories the information can be exchanged electronically to the blind. The knowledge can be stored in the system for wider distribution.

3.3 Improve Knowledge Access

Through networks and resource sharing and consortia one can access the knowledge which is so far limited to few. In India a need of network among the institutions for the blind is to be treated urgently to solve the problem of accessing information. There is no consensus among the institution. Many are providing talking books, Braille text books to support till their 12th standard education. What about their higher education. Delhi University is conducting teacher training courses for the blind. Blind in India are mainly from villages and are economically weak they couldn't afford to purchase technology for themselves. They require separate libraries with assistive and adaptive technology.

4. NETWORKING AND RESOURCE SHARING

Networking and resource sharing is having at most important in today's Library service Because of Information explosion and escalation of prices for the document with out resource sharing one library cannot work independently. In case of Braille Libraries and services for Print Disabled, one can achieve success by sharing resources among themselves. The networking between the publishers, authors, libraries and the organizations is required. Library services to print disabled can generally be divided into two. One with collection of general book which every one required or we can call these books as popular books. The second is those on demand. We can call it as subject books or non popular books. The success of the library services depends on collection, technology, knowledge and attitude of staff, infrastructure and the budget.

One of the examples for a successful network for library services for blind is founded in 1931, the National Library Service for the Blind and Physically Handicapped (NLS) in the United States is the most comprehensive resource-sharing network for public library services. It is a unit of library of congress, the national library of USA. Through this net work the NLS supplies documents talking books guidance to how to use technology etc. As In Canada the Canadian National Institute for the Blind (CNIB) offers a partnership with a variety of public, academic, and provincial libraries. As per

the Vsion 2020 UK, The objective of Share The Vision is to enhance library and information services for visually impaired people by encouraging greater cooperation between publicly funded libraries and the voluntary sector organizations which produce and lend alternative format materials.

5. BARRIERS FOR INFORMATION

5.1 Under Utilization of Funds/Lack of Funds

Unfortunately a very few visually challenged in India have access to technology. Those who are fortunate to have access to technology are mainly from urban areas. Almost all the institutes for visually handicapped in India are in cities. Those who reside in villages and rural areas are not aware of the Schemes of Government , various NGO in this field and other institutes. Hence the visually handicapped do not benefit from sponsorship schemes, training, free educational and boarding facilities offered to them by these groups. In order to bring the visually handicapped from villages to mainstream education special efforts should be taken. It is estimated that more than 75% of visually handicapped in India are unable to gain from the mammoth information explosion and the communication technologies that is revolutionized our way of living . Many assistive technologies like screen readers Braille printers, multilingual editors, Braillie Mitra etc can help the blind to communicate through computer and the internet. Because many print disabled are from low income groups or are economically backward they are unable to access the technology.

5.2 High cost of Hardware and Software

Often the technology for visually handicapped have failed to reach the masses especially in developing nations like India mainly because of two reasons. Firstly because of high cost of hardware and the software. secondly, they do not support regional vernaculars, particularly Indian languages. There are a number of institutes and researchers engaged in similar work areas such as developing tools for the visually impaired. But mass development of these technologies depends upon the initiatives of Government and the cooperation from the industries. Industries are not ready to invest their money in R& D of technology for disabled because the target population is mostly economically challenged, disabled and special population. Many institute are not getting due credit from the Government and the society for their commendable job in this field. I would like to mention some of the Institutes who are in the development of technology in India . IIT Madras maintain a web site exclusively for Visually handicapped in India Automatic Control Equipments (ACE) launched 'Braille Mitra,' a braille reader with a capacity to read up to 11 Indian languages and has 2MB memory. The machine, driven by a micro-computer chip, allows the visually- impaired to read line by line after the software format of the Braille book is loaded into it.

5.3 Lack of Support of Academic Institution for Mainstreaming

The regular schools are reluctant to give admission to visually challenged students. The administrators and management should need to realize that these people are not challenged by intelligence. They are disabled by vision. If the institution can provide right training from an early years then they can also be educated and can be empowered. The training should be provided to access the technology , Guidance and counseling services . Some special schools like Victoria school for the blind in Mumbai provides computer training in association with IBM.

5.4 Lack of Training

Because blindness is a low-incidence disability, most librarians have had little experience in working with visually impaired students and have few, if any, materials in alternative formats readily available. Training to the staff is also an important requirement. Those staff who is handling disabled should have proper training. Then only one can provide education to the disabled. India facing shortage of trained teachers to teach disabled people. Teacher training Institution to train the teachers for disabled should be established. Computer training should be given to all visually handicapped in India irrespective of Cast and creed, and their economic situation. Lack of training on computers is another serious issue. Many organizations are donating computers to the disabled free of cost. But a computer illiterate will not be able to use it until and unless he or she gets special training on them. This training is not available from the normal computer institutes. So special training Modules should be prepared according to individual requirements. Some of the Institutions are doing commendable work on that area. NAB in association with INTEL is imparting computer training in India. NIVH, Dehradun (National Institute of Visually Handicapped) in India is also providing computer Training.

5.5. Inclusive Education

Through the inclusive Education policy, the government intended that disabled from rural areas should get their compulsory education till the age of 14. But the fact is that the regular school has to modify and adapt the curricula according to the needs of Disabled. The staff should be trained to handle the need of under privileged..It should also be noted that to provide information in an accessible or special format requires technology and trained staff. These issues are rarely addressed. Many a times in rural areas the mobility, Transportation etc also hindering to access to educational Institutions. The Institution has to provide accommodation to those people. Lack of Funds and no cooperation from the government makes it difficult to the institutions to provide free education to the disabled.

5.6 Copyright Law

Copyright law in India regarding disseminating information to the visually impaired through CDs, Internet and e-books not addressed so far. The law should be made clear so that the publisher can work on these area and may able to provide information freely to millions of visually handicapped all over the world "Libraries for the blind developed as charities, circulating and producing, for the most part, Braille. Their seeking of copyright licenses to permit them to produce such books did not pose any particular threat to copyright holders and publishers. But as they started taking their places as libraries that rendered library services, and as technological developments enabled them to make and circulate accessible books in various forms to readers with different print disabilities, it became difficult for them to have to seek and obtain such licenses for a variety of reasons. Many governments therefore enacted statutory exceptions to their copyright laws to assist them" (Ross J W)Mann, David in his Article " WIPO- Advancing access to information for Print" examines the role of WIPO as it relates copyright and the and the visually impaired peoples right to read . It refers to the need of an international agreements as well as an accumulation of national legislation. He also explain about two types of Barriers in accessing information one is denying permission to Visually impaired and the second is rights of copyright owners.

5.7 Barrier Free Environment

Occasionally technology is available with the institution .But due to lack of other support systems a blind person may not able to access it. An individual may be affected by a single disability that is Vision; some along with vision impairment may be disabled by deafness, physical handicap or mental

retardation. In this a case barrier free environment is required to access the facilities in the educational institution. Lifts and ramps, proper transport system, public services like toilets, public telephone. Etc. Barrier free environment is necessary for security, free movement and to lead a normal life

5.8 Standards

In India Lack of standards affects the duplication and waste of time and energy in developing the technology. So it should made mandatory for every institution that when they develop material for visually impaired it should follow international standards. Metadata creation should be as per the international standards so that one can exchange data from one country to the another.

5.9 Web accessibility

Refers to the practice of making websites usable by people of all abilities and disabilities when sites are correctly designed, developed and edited, all users can have equal access to information and functionality. For example, when a site is coded with semantically meaningful HTML, with textual equivalents provided for images and with links named meaningfully, this helps blind users using text-to-speech software and/or text-to-Braille hardware. When text and images are large and/or enlargeable, it is easier for users with poor sight to read and understand the content.. Carey, Kevin in his article asks all the stake holders and Librarians to work towards a global digital accessibility library and advocate a generic right to information. In a global digitally converged environment VIPs will need help with navigation, data evaluation and file migration; these needs will alter the traditional, neutral, role of librarians, transforming them into facilitators, covering what were traditionally described as broadcasting and telecommunications. The biggest single problem for VIPs will be the explosion of digital static and moving pictures

5.10 Internet

Kevin Carey observes that internet also become a challenge an opportunity for Visually handicapped. As internet is heterogeneous the skill is required to surf through and find out the exact information of their choice. "The opportunity is to lift VIP content access out of its traditionally narrow channel which has limited their outlook and made reading a largely conformist, as opposed to a heterodox experience, largely dependent on institutionally mediated alternative format production and regulated broadcasting. The challenge is to direct content access towards the purpose for which it is required. We need to bear in mind, however, that the Internet is in a state of transition from a largely textual to a largely multimedia carrier"

5.11 Online Catalogue

Library needs an online catalogue which is accessible to VIPs . with speech synthesizer visually impaired can access the catalogue and able to select independently what they require from the library.

5.12 Archive Services for Visually Impaired

Andre Whitesides Says" The provision of information services to the visually impaired is by no means a new discipline—libraries, for instance, have been making material available to visually impaired users for decades by means of technological and format provision. Somewhat surprisingly, however, the archive profession seems to have largely excluded itself from the trend in the information services sector to adapt to the needs of the visually impaired" He discuss about British libraries. In India Visually Impaired is need for archive services is never addressed so far. For the research these population needs archival services.

6. LIBRARIANSHIP FOR VISUALLY HANDICAPPED

Today Librarian is not considered as custodian of information. He is considered as disseminator of Information. Library may not have physical stock of information still he can have remote access of an information .The librarian should know that where and how can he will be able to access the information. He should be well aware of the legal laws, copyright laws and he should be good negotiator. A librarian should negotiate with the publisher, the authors and should be connected with other organizations for resource sharing. A well connected library can access anything available in the world through consortia, interlibrary loan etc. Training for using assistive technology and adaptive technology is a must. In India many organizations like NAB (National Association for the Blind http://www.nabindia.org/), NIVH (National Institute for The Visually Handicapped http // www.nivh.org/) NFB National Federation for the Blind etc are working in the field of disseminating information and providing guidance, training a etc

7. ROLES OF LIBRARY ASSOCIATIONS

Encourage professional organizations to take a leadership role in promoting the accessibility of library resources. The organization like American Library Association and its divisions are already worked in the field of standards, legislation, web accessibility issues etc. . They should make explicit on their websites that they are committed to accessibility and encourage feedback from visitors. They should make sure that their conferences include content on legislation, policies, guidelines, and design regarding accessible electronic products. (Sheryl Burgstahler) In India ILA (Indian Library Association http://www.ilaindia.org/) have no part in developing standards and raise the awareness about accessible issues in India. As far as this organization is concerned it is yet to develop any mark in this area.

The American Library Association's (ALA) *Library Services for People with Disabilities Policy*, states that "Libraries must not discriminate against individuals with disabilities and shall ensure that individuals with disabilities have equal access to library resources."

Disability discrimination act and web accessibility of Australia ensures that websites are accessible to blind and disabled users.

The UK also have a disability Discrimination act which is enforced on 1995 The Disability Discrimination Act 1995 (the DDA), was introduced with the intention of comprehensively tackling the discrimination which many disabled people face. The main part of the DDA that applies to websites and requires them to be accessible came into force on 1 October 1999. Further changes were made to the Act in 2005 which required certain employers and service providers previously exempt from the Act (such as the police and small employers) to comply with the Act and therefore make their websites accessible. Changes to the Act in 2005 also brought in.

In India we have also legislation But not as depth as that of USA and UK. **Persons with Disability (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995,**

"The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995" has come into force on February 7, 1996. [This law is an important landmark and is a significant step in the direction of ensuring equal opportunities for people with disabilities and their full participation in the nation building. The Act provides for both preventive and promotional aspects of rehabilitation like education, employment and vocational training, job reservation, research and manpower development, creation of barrier-free environment, rehabilitation of persons with disability,

unemployment allowance for the disabled, special insurance scheme for the disabled employees and establishment of homes for persons with severe disability.]

In India law is not making it mandatory to have accessible websites. Hence it is required to amend the law and make it accessible to all who are disabled.

7. WEB RESOURCES

Disabled person should get equal access as compared to their counterparts. But in reality they are ignored from our society. Many NGOs and governmental Institutions are doing their best to impart education to the blind and print disabled in India. Some of the national Institutions are listed below who are doing remarkable services to the visually challenged in India.

7.1 Braille Libraries and Organization for the Blind in India

7.1.1 National Institute For The Visually Handicapped

116, Rajpur Road, Dehradun (U.A.) - 248 001

Web Site: www.nivh.org

- The National Institute for the Visually Handicapped (NIVH) at Dehradun is an apex body in the field of Education and Rehabilitation of the Visually Handicapped in India under the Ministry of Social Justice and Empowerment, Government of India.
- The Library offers free lending services to the visually handicapped readers all over the country. The Institute publishes a quarterly newsletter, INSIGHT, which contains useful information about the activities of the Institute and of information relating to rehabilitation. The Institute has also started to publish a Weekly News Magazine entitled "Braille Times" which provides news to its Braille readers

7.1.2 NAB: National Association For the Blind, India (http://www.nabdelhi.org/)

Is the largest non-government, voluntary organization in India. This institution have 19 state and 65 district level branches to reach the large number of visually challenged people. Established in 1952 by Mangulal Jethalal Shah with a determination to establish NAB as an icon of unlimited service to the Blind .it was registered under Bombay public trust , 1950.

Contact Address:

National Association for the Blind, India,
Department of Employment, 2nd floor,
11/12, Khan Abdul Gaffar Khan Road
Worli Seaface, Mumbai 400 025

In 1961 first home teaching service was established and in 1963 the first talking book center was established.

Special Facilities at NAB

- Training for Teachers
- Man-power Development Programme
- Training Centre for Teachers of the Visually Impaired (Primary)

Most people who walk in to the M.P Shah all India Talking Book Library in Worli won't believe the amount of work that goes in to seemingly simple task of creating audio cassettes out of books. It

houses nearly 1,50000 talking books which are available in nine different languages. The Library itself is efficiently catalogued, and the only prerequisite for its use is that person must be visually challenged and must produce a certificate proving this.

1. National Federation of the Blind

The National Federation of the Blind was set up on 3rd March 1971, and is a pro-active self-help group which works under the motto "Let the Blind Lead the Blind." It has a nation-wide network of affiliates and branches, and has played an important role in securing employment for the disabled. It has over forty branches, affiliates and units. The national office in New Delhi runs the following services:

- Braille Library Project
- Braille Press Project
- Placement Service Scheme
- Self Employment Scheme
- Mobility Service scheme.

Address: National Federation of the Blind
2721, Sewak Sanghtrashan
Pahargunj
New Delhi 110055

2. Blind Relief Association, Delhi

Founded on 26th February 1944 the Blind Relief Association, Delhi is a premier organization working for empowerment and rehabilitation of the visually challenged through providing them education, vocational training and a host of other services.

The Association is running a Senior Secondary School for the Blind Boys, a Technical Training Centre imparting vocational training in industrial/engineering and other trades and skills, a College conducting Bachelors in Special Education course programme under the prestigious University of Delhi, besides a variety of services. These facilities and services directly or indirectly benefit thousands of visually impaired and persons with other disabilities.

For the benefit of the students of the school, university students and research scholars, the Association runs a reference library. The library houses over 3000 volumes in Braille and over 1000 printed texts

Its Braille Production Unit has a computerised braille production facility with two electronic braille printers and transcription software for books in English, Hindi and Sanskrit. It also has a Cassette Recording Studio for text books.

Contact details:

Mrs. Romila Ahluwalia,
Blind Relief Association
Lal Bahadur Shastri Marg, (Near Hotel Oberoi),
New Delhi 110003
Website: www.blindrelief.org

University Libraries:

3. Delhi University

Braille Library: The Delhi University Braille library was established in the 1970s and was indeed the first of its kind at that time. It still produces Braille material manually and is regularly used by the visually impaired. However, with the availability new Braille technology, the University is trying to augment the facility based on current needs. The Braille library is located in the Central Library of the University;

Audio-book Resource Centre (ABRC): The ABRC provides recorded cassettes to

visually-impaired students. There are three recording studios in the ABRC which is located next to the Braille library in the Central Library. ABRC makes an effort to identify the books students might need most and undertakes to record them. It has a collection of several hundred recorded books available for use.

4. The U.P. Jagadguru Rambhadracharya Handicapped University

This institution was established to provide higher & professional education to persons with disabilities

Jagadguru Rambhadracharya Handicapped University, Chitrakoot, Karwi (UP)-210204

INDIA Phone: +91-5198-224481, 290454

Fax: +91-5198-224293, 290111

E-mail: jrhuniversity@yahoo.com

Universities central library is Enriched with courseware's , magazines & journals to provide disabled 'A better educational environment'

8. RESOURCES FOR VISUALLY IMPAIRED IN INDIA

8.1 Assistive Technology

Blind and partially sighted students must access print resources in alternative forms. Although technology enables access, adapted materials such as audio textbooks are not readily available. Adaptive technology magnifies print or transforms it into audio or tactile forms, while speech synthesizers verbalize electronic resources.

The Technology may be able to help the blind in the workplace, classroom, or the management of their home. Standard personal computers can be modified using large print, speech, or Braille adaptations. Adapted computer systems can be used to send and receive electronic mail, browse web pages, compose documents, work with spreadsheets and databases, and much more. Closed Circuit Television systems can be used to enlarge every day print. The Technology for the Blind Program also provides adaptive devices such as talking and large-print calculators, Braille writers, four-track tape recorders, note-takers, and other specialized adaptive devices for use in the workplace.

8.2 Web-Braille

Its an Internet, web-based service that provides, in an electronic format, many Braille books and Braille magazines that are produced by the National Library Service for the Blind and Physically Handicapped (NLS). The Web-Braille site is password-protected and all files are in an electronic form of grade 2 Braille, a format requiring the use of special equipment for access. Links to Web-Braille books are included in the NLS online catalog. This catalog is located at www.loc.gov/nls The advantages of offering Braille material on the Internet A user needing immediate access to specific

information contained in an online braille book can obtain it in a matter of minutes, without waiting for the mail or dealing with bulky volumes.

8.3 Descriptive Videos

Descriptive videos are regular, commercial films which have been augmented with special narration which describes the action for people who have visual impairments. As a descriptive video plays, it describes the visual elements of action, characters, locations, costumes and sets to the viewer without interfering with the movie's dialogue or sound effects.

8.4 Talking Books

Most visually handicapped people lose their sight in middle age or later and comparatively few of them learn to read Braille proficiently because the tackle sense diminishes with age. As a result, the talking book has over-taken Braille in popularity. For example M.P Shah Talking Book Library of NAB offers currently 150000 cassettes. [Audiocassettes also play a vital role for blind students in terms of both exposure to literature and information gathering. As a student becomes older, particularly as she or he reaches college age, cassettes are often the only alternative format available. But, it is still necessary to have at least some Braille and large print material on hand, so that visually impaired students are given a chance to improve their literacy skills. Without practice actually reading, whether it be large print or Braille, blind and visually impaired students do not learn the spelling, grammar, punctuation, or basic structure of the language, and as a result, many have a great deal of difficulty writing clearly and coherently] (Hart Elizebeth)

8.5 I-Pods, MP3 and other devices

Gone are the days when the blind and visually impaired preferred to get into colleges which provided tape recorders and cassettes. Today, they prefer to record college lectures on their I-pods and keep in touch with their families and friends through mobile phones tailor made for them. pods, which can record data up to 24hrs, are often used to record classroom lectures

MP3 players and pen drives are used to not only record data but also store and carry it all. Screen reader software that can be installed in mobile phones. Talking software helps the blind to surf the internet and download data

9. CONCLUSION

I would like to quote "Wherever a door is closed to anyone because of a disability, we must work to open it. Wherever any job or home, or means of transportation is unfairly denied because of a disability, we must work to change it. Wherever any barrier stands between you and the full rights and dignity of citizenship, we must work to remove it, in the name of simple decency and simple justice."

- President George W. Bush, announcing the New Freedom Initiative at the White House, February 1, 2001

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Maximisation of the Use of Libraries in the Electronic Environment: A Study with Reference to Selected College Libraries in Mumbai City

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Abstract: Librarians and users attitudes toward instructional methods and contents for teaching skills to access the information available in various formats were assessed. *The results of the survey revealed the discerning scenario of User Education Programme.* A surprising number of users *did not know about the user education programme since many colleges are not offering proper user education.* To be successful, the systematic user education programme be made compulsory and proper curriculum must be designed at different levels of higher education system.

Key words: **User Education, Electronic Environment, Academic Libraries.**

1. INTRODUCTION

Present century is witnessing the outbreak of technological developments and as a blessing in disguise this has manifold benefits to the library users. It is true that information is available in innumerable channels and this has led to proliferation of information beyond anybody's imagination which has led to phenomena called information explosion. In such scenario, understanding information needs of user's community is very critical. Users are really struggling as there is too much of information to choose from. Absence of properly developed user education program is the main cause for this. In other wards enabling users to choose right information at the right time has become a main challenge in these days. Existing traditional practices in educating the users in coping with the influx of information resources are far from satisfaction and new thinking is the need of the hour.

2. MEANING OF USER EDUCATION

The term user education has risen from the concept of reference service. According to Norman Highman, there are three aspects of user education: firstly, helping them to use the library; secondly, help them to use the literature; thirdly, using the literature for them[1]

Nancy Fijallbrant and Ian Malley states that, "User education is concerned with the whole information and communication process and one part of this involves the total interaction of the user with the library. This should be continuous process starting with school and public libraries and with possibility of extension into academic and specialized libraries"[2]. Infact, broadly speaking, "User education encompasses all types of activities designed to teach us about library services, facilities and organization of library resources and search strategy". Therefore, it can be said that this is a program designed to teach users the necessary skills to access the required information independently.

3. NEED FOR THE STUDY

In earlier days the education system was class room centered and the teacher was considered as a "sage on the stage", but today the education system is more a student centered and library centered. Today library users are facing the problem of using the multi formats of information resources effectively

and with some purpose. Added to this slowly and steadily the electronic sources are entering into the library collection and most of the users are very much tempted to use these resources.

With the tremendous growth of information in various fields of human endeavor, new methods of bibliographic control, the introduction of new media of communication and the increasing focus on individual duty require the users of libraries especially academic libraries to have systematic rather than haphazard approach to their use. The application of new technology in information retrieval requires training for users. The changing pattern of education has also increased the necessity and the urgency for user education. Today, most of the libraries are using computers for information storage and retrieval. The need for instructing students in the proper use of library resources and services is increasing day by day.

In this context, the challenge for library professional is to **train and retrain** the users in the use of both print and electronic information resources. In the light of these challenges faced by users, it is felt necessary to study the adequacy and suitability of user education being provided in electronic environment for maximizing the use of library resources. Therefore, an attempt is made in this paper:

1. To know the collection of the academic libraries both conventional and non-conventional form.
2. To understand the methods and contents followed in user education programme in the libraries covered under study and
3. To know the extent of IT application awareness in the users.

4. OBJECTIVES

The objective of the study is to;

- Understand the implementation status and developing trends in user education in college libraries
- Identify the various methods of user education program through which users are trained
- Identify users familiarity in accessing varieties of available e-resources
- Study the impact of information technology in making user education programme effective
- Identify the difficulties and problems the libraries are facing when implementing user education programs

5. HYPOTHESIS

- Users are having little or no awareness of user education program.
- Faculty and students feel that proper user education would make them good information users.
- Users feel that locating, identifying, accessing and finally using information for their academic activities is easier in using electronic resources than using print resources.
- Users need more training and guidance on how to access and use electronic information resources.

6. METHODOLOGY

In order to investigate the existing situation the Questionnaire method is adopted to collect the data. Well structured Questionnaire was designed and brought to the notice of the experts and other fellow professionals. To validate the suitability of the questionnaire a Pilot study was conducted on the selected samples which are collected randomly among the total population identified for the survey. After analyzing the responses the questionnaire was revised and finally the edited and revised

questionnaire was administered to all the Colleges under study with a purpose to know in detail the opinion of both users and the library professionals.

Apart from the questionnaire additional methods like discussion, observation, documentary sources, and interaction with experts are used to collect and consolidate the data. This has facilitated to a considerable extent to analyze the data. Totally 95 questionnaires were distributed to the College librarians. Out of them 75 (78.95%) librarians responded and 950 questionnaires were distributed to the users and the response rate was 79.37% (754).

7. FINDINGS OF THE STUDY

On the basis of the results of the survey the significant findings of the study are drawn from the point of view of Librarian's, who are the policy makers and programme implementers and also user's point of view since the user is the main focus of the library.

7.1 Librarians' Point of View

- Most of these colleges are offering various other subjects apart from their regular degree courses. The increase in the range of courses has changed the teaching and learning better and has an impact on user education programme.
- Technology invasion has made a remarkable change in the library collection. From responses, it is seen that most of the libraries have CDs, DVDs, Cassettes, and few have electronic journals in their collection apart from traditional books and journals. Librarians are convinced with the technology they are using but they need proper guidelines to expose these kinds of non-book materials.
- The data collected from the respondents presents encouraging picture about the computerization of their libraries. It is observed that maximum numbers of libraries are computerized with suitable library software.
- The Internet connectivity is very much essential to access the electronic information like online databases, e-journals etc. The use of Internet service is strongly felt in most of the libraries. Internet has opened the gateway for open sources. Some such e-resources are useful for the users which they may not get in print form.
- The study reveals that about 60(80%) Libraries are providing User Education. In most of the libraries 50(83.33%) the duration of User Education Programme is less than one hour.
- Among user education methods, individual instruction 60 (100%) is the most widely used method. In 46 (76.67%) libraries special promotional activities and introductory briefing in the orientation programme is preferred in over 45(75%) libraries.
- In order to augment the methods that are used to conduct the user education it is advised to have proper content for the same. The most prominent contents are; general introduction about library facilities and using library catalogue 60(100%), reference sources and locating library resources 51(85%), methods and tools for searching information 34(56.67%), access to information on Internet in 42(70%) libraries.
- 52.5% of the practicing librarian's have opined that information technology (IT) has a great deal of impact on user education methods and contents and about 44% have stated it is quite a bit.
- The user education program is a must in all the libraries as it helps the users to access the required information, without much assistance of the library staff. But under some unavoidable circumstances the librarians or the library staff faces some problems in imparting user education.

- The study reveals that Lack of proper curriculum is the major hindrance for conducting user education program. Hence, systematic curriculum for user education is the need of the hour.
- To measure the effectiveness of any system, feedback is essential, which in turn helps to analyze, evaluate and revise the existing content of that system. Most of the librarians who are providing user education are hardly bothered to evaluate and improve methods of user education program.

The following are some of the points which are observed as the findings of the study from the point of view of user's:

7.2 User's Point of View

- Users of this study consisted of faculty members and students of academic colleges in Mumbai. It is observed that of the total 754 respondents, 29.58% are faculty members and 70.42% are students.
- Understanding the purpose of users using the resources for accessing the information which is available in variety of form is significant in many ways. It gives directions for providing better services and facilities to the users. Keeping this in view, users were asked to mention the resources used for accessing the information.
- It is revealed that 46.42% of users use card catalogue and 46.15% use Internet. Considerable percentage of users i.e. 31.30% use OPAC service and only 19.36% of respondents use bibliography.
- There is a tremendous response from the users for accessing the Internet. The respondents said they are accessing the same in their home, library, cyber café and in college computer laboratory. Mainly it is used for completing the projects, writing the seminar papers, class assignment, searching e-journals and online databases etc. Some also use it for entertainment & chatting.
- Majority of them have indicated that they are good in browsing the information with the help of search engines like Google, Yahoo etc. and hence the hypotheses: *Users feel that locating, identifying, accessing and finally using information for their academic activities is easier in using electronic resources than using print resources* is Proved.
- More than 54.91% of the respondents said that they have not received user education and 45.09% indicated that they have received it. About 82.35% respondents admitted that they have not benefited from it. Thereby, it proves the hypotheses of the study i.e. *Users are having little or no awareness of user education program.*
- Coming to the point of methods of offering the user education all of them admitted that they receive individual instructions (100%) and few 36.76% admitted that they receive instructions only in handling computers.
- From the study it is found that Users have a very positive attitude towards User Education Programs. Majority of them 558 (74%) have indicated that information searching skills are necessary and needed for their academic career and life-long learning, hence, the hypotheses *'Faculty and students feel that proper user education would make them good information users'* is proved.
- It is indicated from the study that users are serious in acquiring information searching skills. About 69.75% of respondents suggested that User Education should be both 'Theoretical and Practical'. This proves the hypotheses: *Users need more training and guidance on how to access and use electronic information resources.*

On the basis of the observations and the enlisting of findings of the study the following suggestions are being suggested:

A) SUGGESTIONS FOR ACADEMIC LIBRARIES

- Librarians should stress the need for compulsory user education program at different levels of higher education system for promoting the proper utilization of library resources.
- The organizational structure of library should be modified in order to make user education program a regular successful venture.
- Librarian should partner with the teaching faculty and other technical personnel in order to provide effective training for users.

B) SUGGESTIONS FOR LIBRARY AND INFORMATION SCHOOLS

- LIS Experts should suggest for integration of user education as an integral part of higher education curriculum.
- The curriculum also needs to be planned in such a manner that practical aspects become more stressed part of user education.

C) SUGGESTIONS FOR POLICY MAKERS

- The policy makers should provide adequate financial and human resources in providing user education program.
- State government and UGC should take initiative in directing the higher educational institutions to integrate the user education program across the curriculum by designing a separate paper at HSC, Graduate, Post-graduate level.
- The authorities at different level of planning and program implementation should come forward and formulate a national information policy to promote the cause of user education program.

8. CONCLUSION

The technological developments and new approaches in information handling have added a new dimension to the user education. Internationally it is widely accepted that information skills are necessary and play a vital role in helping to prepare users for the rapidly changing complex information environment of the 21st century.

The availability of information in various forms and formats has been a great cause of concern not only to the users but also to the library professionals. Many of the users are to a large extent ignorant of the methods of using the current medium in which information is stored, the nature and type of service available and also the existence of sources, which may be of relevance to them. Therefore, the results of the study clearly indicate that there should be a proper curriculum for user education programme and it should be implemented with right spirit in order to maximize the use of both print and electronic resources and also prepare the users as responsible citizens of the country in the 21st century.

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OpenURL: Context Sensitive Linking Technologies for Online Resources

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Abstract: This article sketches the development and implementation of existing techniques for the seamless reference linking of scholarly research materials and the new techniques designed for advanced linking are described. It presents several new technologies currently under development, with an eye toward enhancing resource discovery and the interlinking of resources. This paper also describe the implementation of Web 2.0 and Library 2.0 tools to existing resources have combined in opening up new avenues of linking previously isolated resources together.

1. INTRODUCTION

Availability of Internet resources has revolutionized the research process. Enhanced resource discovery and being presented with links to related subject matter, with the major benefit coming from the convenience of performing research in a virtual environment. Initially, Internet based resources were located at static URLs on servers, with established links pointing towards these addresses. When the addresses of these resources changed through relocation to a new server or site redesign these connections were broken, necessitating frequent verification and updating, highlighting the need for more reliable forms of linking these resources together. Several techniques have been introduced in a search to resolve this dilemma, culminating in the digital object identifier protocol and the present open URL standard. This paper provides insights into the concepts underlying the OpenURL framework for open reference linking in the web-based scholarly information environment.

2. LINKING RULES AND THE COPYRIGHT ISSUES

The focal point of all types of linking initiatives focuses on directing users to accessible and licensed material. In order to address the problem of linking to the "appropriate copy," several proprietary and provider specific linking programs were initiated. In these instances, a subscriber indicates to database vendor the accessible resources for that given institution. The vendor then applies that information using proprietary programming providing outbound links to the appropriate copy. These technologies present the user with reliable context sensitive links from abstracting and indexing databases to an institution's subscribed resources.

Examples of vendor supplied context sensitive linking products include: Ebsco's Smart Links, the Institute of Physics's HyperCite, NioMednet's Budled Link, OVID's Open Links and Silver platter's Silver Linker products. Also several publishers provide proprietary "link-to-services" such as Academic Press, the American Physical Society, Elsevier and UMI's sitebuilder. Applying these services allows for context sensitive linking to the appropriate copy problem can be addressed by using the linking to a library holding by means of publisher service, like Silverlinker, or a link resolver, such as SFX, based on technology developed by Herbert Van De Somple. However, with the increasing number of electronic resources available, maintaining these systems increasingly have become problematic.

At the same time, publishers and providers were working on providing bidirectional-linking services. Beginning in 1997, one of the first efforts for providing outbound linking to related resources began with the Chemical Abstracts Servide's Chemport Connection http://www.chemport.org/. Several publishers and content providers followed by offering inbound links to CAS under the name "Chem Port Reference Linking Services" (Grogg, 2004). The Web of Science aggregator from the Institute for Scientific Information offers both bidirectional linking between web of science records and content from selected publishers. Openly Informatics also provides an inter publisher linking solution called "Scholarly Link Specification Framework."

While not providing the standards based linking protocol the open URL would later become, these services were a precursor of the open URL and basically solved the appropriate copy problem.

3. STANDARDS AND TECHNOLOGIES: OPENURL AND DOI

Standards that are often mentioned in relation to linking functionality are DOI (Digital Object Identifier) and cross-reference. Two technologies widely recognized today for solving the problems associated with reference linking are the open URL and DOI, with both of these technologies providing a means for dynamically linking electronic resources.

The earliest proprietary linking systems required extensive maintenance and formal inter publisher agreements. These particular problems were remedied by the publishers International Linking Association in 2000 through the work of the Cross Ref Initiative. The Cross Ref System uses digital object identifiers (ODIs), which are unique identifiers tagged to the specific article's metadata. The DOI of an Internet resource is permanent, so that the content can always be located, even if the URL changes. The DOI is governed by the International DOI Foundation and managed by Cross Ref organization which operates a citation linking system requiring providers to deposit DOIs and associated citation metadata. This system allows a researcher to click on a reference citation on one publisher's platform and directly link to the cited content on another publisher's platform. Implementation of the DOI ensures permanent inter publisher links (Grogg & Tenopir, 2000). In 2005, the syntax for the digital object identifier was standardized by the National Information Standards Organization as ANSI standard Z39.84.

However, this reliance upon DOI linking potentially presented drawbacks for the users. When a user clicks on a link in reference list of a journal published by a participating publisher, he or she goes to the publisher's Website, where access is determined by subscription. In some instances, full text access may not be available directly from the publisher but through another route (an aggregator, secondary provider, or an institutional repository). Currently the Cross Ref link only takes the user to the publisher-supplied full text, not necessarily to the "appropriate copy." The DOI reliably identifies where a resource is located, however it may not identify whether the user has full text rights or not. Cross Ref's ability to link the user to the full text is extremely limited in that it can only direct the user to the URLs supplied by Cross Ref members. Cross Ref alone cannot identify those resources to which the library subscribes (Grogg, 2005).

Beginning in the late 1990's, research was conducted examining the possibility of using journal metadata in creating a dynamic link to the resource. (Beit-Arie, Oren, Caplan, Priscilla,etal.,2001) Herbert Van de Sompel, and others developed the ides behind the openURL. This open source means of reference linking depended on a link resolver to retrieve resources. The resolver could then be populated with those resources where full text rights exist. For example, when an article search is

conducted within an openURL enabled database, the search results will display outgoing links to the relevant open URL resolver. Thus, in this case the database is acting as an "openURL source". Conversely, an "openURL target" refers to the incoming request to a specific electronic resource. Then, when an incoming request to the open URL link resolver arrives it takes into account access rights and directs users to the appropriate full text source. The openURL protocol is now standardized by the National Information Standards Organization as ANSI standard Z39.88. OpenURL Version1.0 has been superseded by version 1.0 furthering the development of context-sensitive linking (Grogg, Development, 2006).

Increasingly, the openURL framework is being marketed by providers. Taking advantage of this opportunity link resolving software from Ex-Libris(SFX), Endeavor (LinkFinder) and others become more available and are being widely adopted. Both of these standards are widely used to provide context sensitive linking in a cross-publisher setting, as well as from libraries to content providers. In addition to linking users with the appropriate full text resource, these systems can also provide information about related resources such as the availability of print resources or perhaps directing users to interlibrary loan services if the resource is not available. The simplicity and transparency in access offered by open URL resolvers helps keep patrons happy and helps keep them coming back (McElfresh, 2005).

4. REASONS FOR BETTER LINKING PROCEDURES

The use of the open URL standard combined with the added features of link resolving technology simplifies and improves context sensitive linking between resources. As a result, various link-resolving technologies have been adopted in academic libraries (see Figure 1 for a comparison of the request flow for various linking services).

The development of these advanced tools facilitates linking between resources, creating a more personalized and user-friendly approach enhancing interoperability and resource discovery in a scholarly environment. However, as the advantages of these new linking tools have become apparent these new technologies have been adopted by a growing number of libraries and scholarly research providers as well as commercial enterprises.

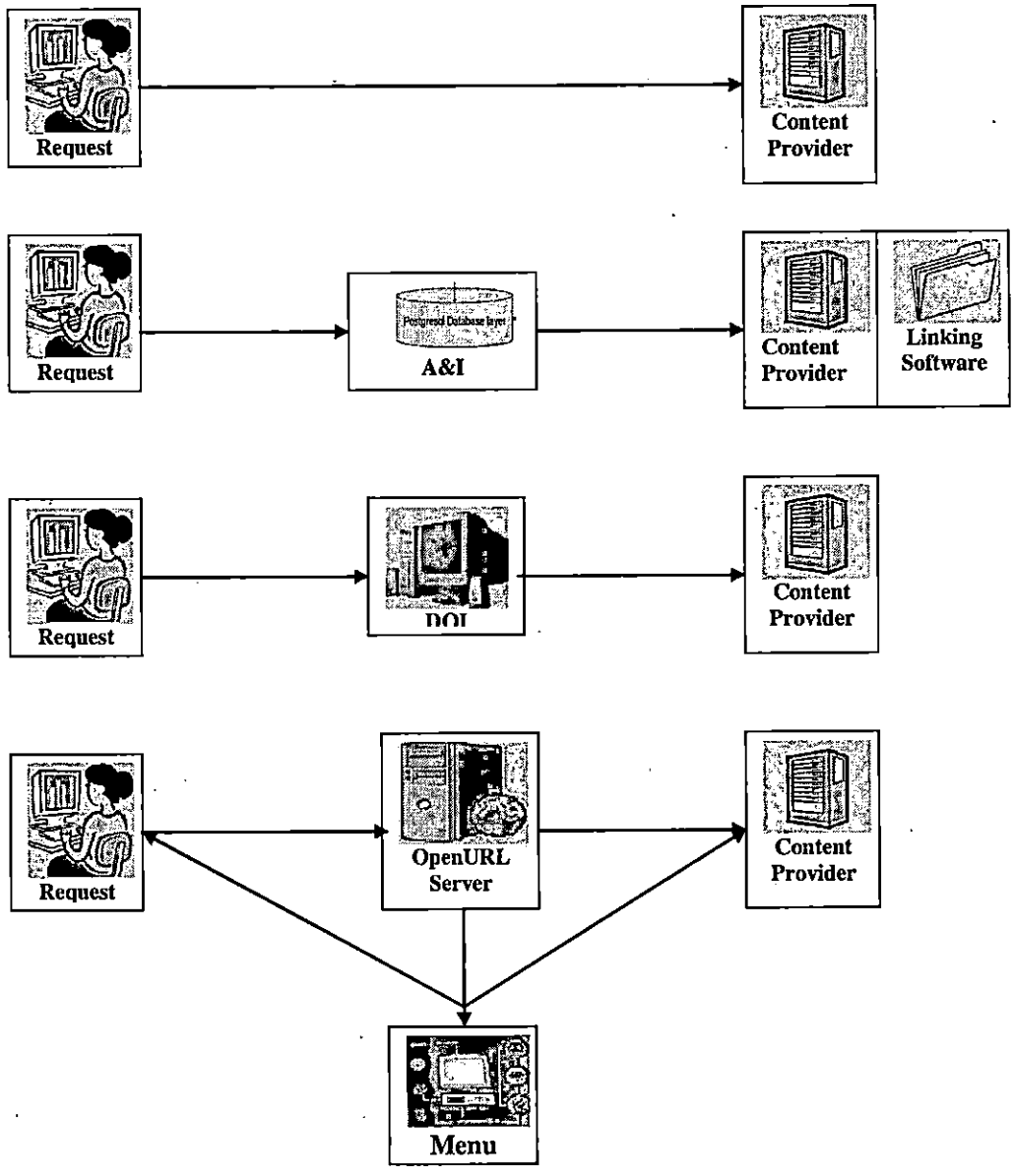


Figure 1. Request flow Comparison of linking services

5. USERS PERSPECTIVES

The combination of link resolving technology and the openURL standard have substantively solved the problems arising from linking to non-authenticated versions of the material. The combination of these elements makes it possible to provide access to the appropriate copy of the material requested, as well as providing links to related resources. Secondly the DOI has solved problems associated with inter publisher linking by providing a standard protocol linking to a publisher's content.

While the techniques of recalling information have been addressed, the process of resource discovery also involves recognizing the existence of other information sources and providing the user with appropriate links to these resources. In accomplishing this, new techniques need to be created and applied to existing research tools; thereby providing links to related content and also providing users

with means to access and utilize these materials. This is accomplished with the combination of advanced linking procedures along with the innovative use of computer software technology and programming.

6. LINKING ENVIRONMENT

Vendors offer similar functionality regarding linking to external and internal content, with generally only minor variations. Researchers are often presented with multiple linking options within an article or citation that my include : (1) links to the full-text through a cited reference or the reference list; (2) links to other proprietary services such as crossRef or Scopus; and (3) possibly navigational links within an article or citation taking the researcher to appendices, charts and tables, or possibly an outline of the article presented as a series of links allowing the researcher to quickly move through an article.

Innovative forms of linking designed to address these linking problems to related materials have been introduced by content providers, with some examples including: forward, citation, dynamic, and conceptual or associative linking.

Forward linking, or "cited-by" links provide researchers with links to articles citing the retrieved article and linking users to more recent articles on the same topic. This concept was first introduced in 2004 by Cross Ref and Atypon and requires that publisher participants deposit citation metadata with CrossRef, allowing them to construct the appropriate links. This kind of linking has been accepted and adopted by several providers including: the American Physical Society, BiOne, Blackwell's Synergy, the Institute of Physics, and others.

The article Five Future for Academic Medicine in the journal Plos Medicine (DOI http://dx.doi.org/10.1371/hournal.pmed.0020207) illustrates an example of forward linking. In this instance, a link is provided to a list of seven other articles citing this particular article (Awasthi, Beardmore, Clark et.al., 2005).

Conversely, citation or "backward" linking provides the user with links to items containing material cited by a particular article. Examples of forward and citation linking are illustrated by Blackwell's Synergy product. Articles within that product provide both forward and citation links to the "appropriate copy" via an openURL link resolver.

Another form of linking gaining adoption is dynamic linking, a method employing a computer algorithm to generate links to related resources. Applying this algorithm is a basic concept of various link resolver technologies. In this case, when the link resolver receives a request the metadata is analyzed and links are constructed in a dynamic environment providing the user with access to the material as well as links to relevant research resources such as: local resources, dictionary or thesauri entries, or possibly subject encyclopedias. Using the article listed above as an example, we can see that provides a link to associated PubMed and the Google Scholar records.

Conceptual or associative linking has also been introduced. This linking procedure uses thesauri data for providing links to further information on related subjects, thus going one step further than dynamic linking. This type of "more like this" form of linking often are used in online bookstores and other commercial websites and have seen application to scholarly research as well. In fact, it is being adopted by providers like Blackwell's Synergy for offering links to related resources. By using customized tagging a "conceptual tree" can be built for directing users to materials from broader or narrower subject categories (MilesBoard, Carr, & Hall, 2002).

For example, the Emerald Library presents users with full-text articles that link out to cited references when available with in their database and also links to companion/affiliated services, such as JSTOR and Google Scholar. Researchers searching Science Direct are presented with citations that may contain options linking to the full-text and links within the article, a PDF of the article and what is termed the summary plus of the article. This extended summary includes an abstract, a linked article outline, possibly tables and graphs, along with linked references where available.

A combination of these innovative linking strategies provides the user with a more useful and user-centric method of research and resource discovery while coincidently providing links to a wide variety of related information sources.

The introduction of advanced Web technologies further refines the process of scholarly research providing the user with a more convenient and complete research experience.

7. PROPRIETORS STANDARD

Now a days, the commercial search services Google Scholar and Windows Live Academic also have adopted in the openURL standard. When conducting a search on these services, links are presented to the user which allows for a connection from the search results to local openURL resolvers. In the case of Google Scholar, a file containing an institution's subscribed resources is scanned. When a search on Google Scholar, a file containing an institution's subscribed resources is scanned. When a search on Google Scholar is conducted, the search results are compared with an institutions' metadata which are then used to create links to relevant content. Originally, when Google Scholar was introduced, the search results linked directly to the publisher's site. However, this did not take institutional subscription rights into account. IN response to requests for providing links to the appropriate copy within their search results, Google Scholar was redesigned to act as a open URL source providing links to an institution's openURL link resolver. In 2005, this function became available, providing Google users with links to the appropriate full-text copy (Grogg, Innovative, 2006).

In 2006, Windows Live Academic was introduced; like Google Scholar it provides links to an institution's openURL link resolver from search result. However, Windows Live Academic works in a different fashion from Google Scholar. It relies on IP authentication to determine when to display links to the appropriate openURL resolver. However, the adoption of the openURL standard by Google and Microsoft illustrate that this information retrieval method is gaining popularity and is being adopted by nonlibrary systems.

The introduction of Library 2.0 tools provides new methods of delivering existing library resources making scholarly research and resource discovery easier and more intuitive.

The integration of links to relevant wikis, blogs, blikis, and twikis provide users with current research, opinions, and relevant discussions of topical information. By combining these tools with appropriate commercial search engines, podcasting, vodcasting, RSS feeds and SMS these resources can provide users' with more complete access to research materials.

The use of these Web 2.0 tools also provides a more personalized approach to research and resource discovery than is possible with standard reference linking. Their introduction and use is determined to a large extent by the development of these new tools."...There's still a huge amount of disagreement about just what Web 2.0 means, with some people decrying I as a meaningless marketing buzzword, and other accepting it as the new conventional wisdom"(Notess, 2006, p.40).

7.1 Library 2.0 Tools

The increasing availability of collaborative and social networking represented by interactive applications, such as: Blogs, wikis, social networking and bookmarking, chat services, multimedia, RSS feeds, commercial search services, and other Web 2.0 tools, illustrate the move toward new venues for scholarly research; providing links from traditional resources to these new sources and providing a new challenge in the use of openURL linking services.

The integration of these new tools with link resolving technologies and traditional library software has now become generally known as Library 2.0. Library 2.0 is an evolving concept that will no doubt see ongoing revisions as new technologies become available.

7.2 Browser Tools

Modern Web browsers also provide tools designed to improve the browsing experience that also can be used in providing links to research resources. For example using the JavaScript scripting language to execute applets embedded in Web pages provides enhancements to Web content accomplishing this. In addition, with the introduction of small JavaScript applications called bookmarklets, application can be created and added into the "favorites" or bookmarks of a Web browser interacting with user input or even embedded metadata within the Web page to provide linking with various related resources. This technology can be utilized in several ways to an enhance library linking, specifically, a bookmarklets can be constructed to automatically add the authentication proxy prefix in front of a link. Also, bookmarklets can be used in directing users to a local or remote resource, or perhaps searching for a highlighted word in a dictionary, resolving a DOI, or to searching the local catalog.

Ajax is another one of these new technologies used in creating interactive Web pages and is an acronym standing for Asynchronous Java Script and XML. Ajax is not a stand-alone programming language, rather it is the term used for grouping a number of complimentary Web technologies together, with examples including: Java Script, style sheets, the XML Http Request object, and the document object model (DOM) in developing Web services.

Other Web application support services are available and capable of providing linking enhancements, such as: JAVA, .NET, Python, PHP and Ruby. All of these may be used in developing other Web services. Web applications can be constructed in several different programming languages (Lerner, 2006). There are also applications called widgets that are used for accessing the API (Application Programming Interface) of a Web service, an example being Google Maps or Amazon.com.

Recently, several JavaScript frameworks like Dojo, Bindows, Prototype and others have been developed. These are client-side JavaScript libraries providing for easy and quick construction of interactive Web applications. A more complete list of these frameworks can be found at: http://ajaxpatterns.org/javascript_Multipurpose_Frameworks.

Recently, Virginia Tech University Libraries and Department of Computer science at Virginia Tech developed the LibX FireFox extension, A LibX toolbar can be designed to provide links to the Library's OPAC, an institutions openURL resolver, a DOI resolver, and several other resources, thereby delivering several of the new Library 2.0 tools, Some examples of toolbars made with LibX can be found at: http://libx.org/editions.php

7.3 Web Application and Services

Web logs or blogs have the image of being a social Website or a gathering space, similar to My Space or an issue discussion site like Insta Pundit. However, blogs are also being used to exchange scholarly information and provide a forum for the dissemination of links to relevant Web pages, as well as other media related topics, Bolgs are also used to announced and market library resources. The information contained in a blog is arranged chronologically, enabling readers to easily identify recent or updated information. Blogging has been shown to be a useful tool for broadcasting information to users (Bhatt, 2005; Conhaim, 2006)

Recently, we have seen a variety of blogs established for the purpose of scholarly communication. BlogScholar, located at http://www.blogscholar.com provides news related to academic blog sites as well as a directory of scholarly blogs. Notably blogs were introduced at the University of Illinois at Urbana-Champaign providing a place to discuss he impact of new technologies in scholarly communication, it can be located at: http://www.library.uiuc.edu/blog/scomm/transforming.htm.

The increasing popularity of blogs for transmitting scholarly information highlights the need and desirability of providing users with links to appropriate Web log resources. Blogs, along with RSS feeds are examples of "Push" technologies offering users the capacity to review current information without being deluged and inconvenienced with email messages.

A number of blogs use real simple syndication (RSS) or rich site summary feeds to push information contained in individual blog entries to users in a more targeted fashion than what e-mail provides. Using this method, a user subscribes to the RSS feed which is actually a selection of links generated by software at the host site providing the user with the ability to review updated information at that particular site.

Listservs and email notifications can serve the same purpose, however the use of RSS feeds provides the user additional flexibility to review information in a more targeted fashion. Specifically, RSS can be used to disseminate news, events or summary information on a particular topic.

Additionally, several electronic journals and databases use RSS feeds to distribute table of contents information and current awareness information such as Project MUSE, http://feeds.muse.jhu.edu/latest_issues.html. "Using a variety of methods, content providers create an RSS document, or feed, and make it available for subscription so that users can access content when it is added to the feed"(Cohen, 2005, p. 14). Directories of RSS feeds are available at www.sydic8.com and www.rssfeeds.com

Ward Cunningham developed the WIKI concept in 1995. Wikis are a collaborative means of authoring Web pages and exchanging content; providing a quick and easy method of sharing information between users, linking to relevant content, and commenting on particular research points. Traditional wikis allow anyone to write and edit online documents raising concerns about the reliability of the information (Fichter, 2005).

A hybrid, known as bliki, has recently been introduced, with bliki software taking a middle of the road approach. A bliki is a blog with wiki characteristics in which blog posts can be converted into a regular wiki article. The primary benefit of a bliki is that the originating blog posting cannot be edited, thereby increasing the authoritative nature of the bliki over a conventional wiki (Fichter, 2005).

Another modification of the wiki format is the twiki. Twiki is of structured wikis that have been extended with the addition of various plugins, providing users with the ability to create and use several

types of media content. Twikis are presently in use at the Free Library of Philadelphia and Pace University Law Library.

Podcasting is the method of distributing multimedia files, such as audio programs over the Internet using RSS feeds. Although designed primarily for personal mobile devices, a desktop, an iPod.

Recently, the capability to add video has been integrated into podcasting, adding an extra dimension to an already useful tool. The combination of video and audio is called vodcasting.

SMS can be used to inform users of new sources becoming available, provide quick notes, reminders, short directional or "how to" message which can be sent to user's mobile device on research strategies or important topics. They can also be used to transmit database search results to a user's cell phone or other mobile device, acting as a method to temporarily store and retrieve search results (Reidy, 2004).

7.4 Software Tools

Utilizing openURL link resolvers and other software tools are important to establish appropriate resource linking resources that provide the user seamless access to content. Learning management systems like Moodle or Blackboard are invaluable tools for presenting scholarly materials in a teaching environment. Presenting links to users that direct them to appropriate content is a major challenge.

One tool finding wide acceptance and adoption is the federated search engine. As various database interfaces offer different search features and options that the user must learn before being able to accurately and reliably execute the search. Also, each database might provide different formatting features and the consequent results list might also offer differing information. The advent of federated searching has greatly assisted library researchers (Boss & Nelson, 2005; Curtis, 2005)

With the inclusion of an institution's OPAC, digital repository, local and remote resources, a federated search creates a more comprehensive and complete search, including not only online resources, but potentially adding an institution's pint materials and other resources like multimedia or digitized objects. The Library of Congress maintains a list of these systems that is found at http://www.loc.gov/ catdit/lepaig/portalproducts.html. Although most of these search engines are sold commercially, several are available as open source applications including: DbWiz: http://dbwiz.lib.sfu.ca/dbwiz/, KeyStone DLS: http://www.indexdata.dk/keystone/, ARC: http://oaiarc.sourceforge.net .

Another software method improving resources discovery of scholarly resources are expert systems. These applications present the user with a series of questions or a group of menus relating to their research topic. Responses are analyzed and presented to the user in the form of a dynamically produced set of links to appropriate information source (Ma & Cole, 2000).

A third major type of software tool available is the portal or "My Library" kind of service. This type of service provides a list of research resources which can be customized by the user to reflect his or her personal research needs and in some instances by applying specialized software an individualized profile is constructed reflecting the individual's specific interests. This profile can be stored, recalled and executed providing the user with links to material reflecting the person's specific interests.

The advent of these new software tools provides the user with additional resource discovery tools. However, as in all research, presenting the user with links to the appropriate copy is critical. Integrating local openURL resolvers, as well as innovative browser tools can meet this need.

7.5 Local Resources and Linking

Locally mounted research digital resources are becoming an increasing part of the research experience. Providing users with links to these materials, as well as to remotely located digital archives is an important service. To this end, Open Archive Initiative (OAI) was initiated to build a framework for digital archives. The Open Archives Initiatives Protocol for Metadata Harvesting (OAI-PMH) provides a standard for defining metadata to materials contained within the archive. This standard allows the remote harvesting of metadata, thus providing the ability to present the researcher with links from various local or remote digital repositories. Then, by utilizing mashups, XML programming, and other technologies to interlink these materials with related resources they can then be fully integrated into a libraries' collection providing users with the capability to utilize these materials in context with other resources.

7.6 Advanced Linking

One of the principal thypes of research in the area of resource linking under investigation is the ability to present users with information gleaned from related Web pages found in differing locations. This process is called a "mashup", using RSS feeds, Java Script, or an API, content originating from different locations is integrated directly onto a Web page providing the user with seamless access to these various Web services. For example, a web page of openURL links could use the metadata to display links from a bibliographic service or a page of geographic data might be combined with a mapping service API to display a dynamically generated map. Utilizing mashups provides a method of extending library services by using additional Web services from other locations to enhance content and provide users with more complete and satisfying research experience. Three factors have been identified in constructing mashups, the "right to remix," creativity, and technical know-how (Fichter,2006).John Musser provides a growing list of mashups, APIs, and related information at: http://www.programmable.com/.

Another application that will have an impact on resource linking are "tag clouds." Tag clouds are groups of dynamically generated links to various Internet sources that are weighted according to their metadata with the link text to the content being displayed in a larger or smaller font depending upon the frequency that that particular link is accessed. Created in a variety of methods, often by using Java, Perl, or Ruby, tag clouds can indicate which links previous searchers have found useful. Also, tag clouds can be designed to emphasize links based on other criteria, for example journals having a higher citation rating would receive greater emphasis. Properly designed, a tag could presents the user with visual representations in the from of a clear and unambiguous set of links to useful materials.

Another factor in designing future linking technologies will be a tagging protocol using various taxonomies and folksonomies. Taxonomies are structured forms of organized data and their description, for example, the Library of Congress classification schedules or the Dewey Decimal System are considered taxonomies. Alternatively, folksonomies are unstructured and can be defined by the particular user, responding to how individuals categorize content. Tag clouds from informal folksonomies are as messy as you would expect (Notess,2006). While folksonomies might not follow the formal structured organization offered by taxonomies, they do allow users the ability to link out to content that others have deemed useful, thereby opening up a more collaborative research methodology.

8. CONCLUSION

The OpenURL standard has brought about enormous improvements in linking bibliographic services to full text, document delivery and library holding. The OpenURL mechanism is an efficient way for libraries to automatically offer their users a wide range of pinpointed and exhaustive electronic resource. This technology change the way users finds, navigate and use the electronic resources. OpenURL has typically been used for the article citation, it can also be used to link many web-accessible items. It needs to give more emphasis on International governing bodies.

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Uncovering the Deep Web: Information Literacy for Exploring Hidden Information on Web

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Abstract: The use of search engines to access the information on the web is one of the most basic activities in the academics today. However, conventional, generic search engines like Google, Cuil, AltaVista index only a portion of the web that is easily accessible on surface web and leave huge number web resources, as many as 500 times size of the surface web uncovered. Hence, no matter how expert an user is in advanced search, he will miss out on critical information if he is unaware of the existence of deep web and its significance. This article is focused on creating awareness about deep web in the universities and institutes of higher learning. Authors suggest that to create a greater awareness and to uncover the deep web, the general information literacy programmes on internet may not be sufficient. They say it is essential to have an exclusive programme to teach information skills to explore deep web. This article further suggests the curriculum for such a programme and also lists some of the possible challenges that libraries may face in implementing an information literacy programme on deep web.

1. INTRODUCTION

Internet and World Wide Web have completely changed the way people search, identify, evaluate and access information. For most of the researchers today, web is the first and last place to look for their information needs. With the help of powerful search engines like Google, for any query that a researcher posts, he/she gets few hundred, thousand and even millions of relevant websites list in a fraction of second. This has led to the 'problem of plenty' where researchers find it difficult to make out which piece of information is most relevant and current information that they are looking for.

In spite of spending hours searching the visible, easily found and low content websites, they would still get a feeling that there might be some other authentic source on web that they failed to discover (*Ru and Horwitz, 2005*). Most internet searchers discover only the content that is presented to them through search engines like Google, Cuil, AltaVista or the search directories like yahoo, About.com, etc. This approach limits our search to only 'surface or invisible web'. In reality, the internet or web consists of many times more resources than are found on the surface web, forming what is commonly known as 'deep web' or 'invisible web'. Since deep web resources are not accessible through general search tools, this requires us to change our search strategies.

2. WHAT IS SURFACE WEB?

The Surface Web, as the name itself suggests, consists of all web resources that are indexed by common search tools like directories, generic search engines and meta search engines. Each of these tools consists of a unique database of web pages that that are available on web. The size of this database, the way it is constructed, the currency of the database and the algorithm used to search the database and rank the search output are the critical factors that determine the success of these tools in navigating the surface web. Surface Web, thus is the collection of all databases of web pages that are indexed and made available for search.

Estimating the size of the whole web is quite a difficult task owing to its every dynamic content. Nevertheless, it is possible to assess the size of the publicly indexable web. This indexable web is nothing but the Surface web that is considered for indexing by the major search engines. The size of

the Surface Web can reasonably be determined by the size of the database of popular and most omnipresent search engines. For example, as on date (September 2008) Cuil, a newly launched search engines claims that it indexes as many as 121.6 billion web pages ***(www.cuil.com/info)*** which is three times more than what Google indexes (40.5 Billion) and ten times more than Microsoft MSN search Engine (12.16 billion).

3. WHAT IS DEEP WEB?

Deep Web, also popularly known as 'Invisible Web' is primarily the information that popular, traditional search engines cannot or will not index. It refers to the vast repository of information that search engines and directories don't have direct access to, like databases. This information is stored on the web within various non-textual formats and free content-rich databases created by government agencies, educational institutions, and other organizations around the world. Most of the deep web content resides within specialized databases (Lackie, 2003). It encompasses a universe of information which remains undiscovered in spite of the advanced search technologies of general search tools like Google, Cuil, and AltaVista. Search engines like Google can at the most locate the homepages of these specialty databases, but it cannot search their entire content.

3.1 Characteristics Of Deep Web

Size: The deep web is approximately 500 times bigger than surface web in terms of number of pages (Carlson and Repman, 2001). Additionally, relevance of the search out put is three times better in the deep web. Fees or subscriptions limit access to deep web and, one should note that roughly one third of the 60 largest sites representing a total 10% of information are fee-based. This could be only a reasonable guess as it is said that number of pages getting added to the deep web are comparatively more than those getting added to surface web. Deep websites are much larger in terms of number of records, while document size is smaller by an average 27%. The average invisible web site receives about 50% more traffic than its surface counterpart.(Bergman, 2001)

Ambiguity: It is very difficult to exactly understand what sites or kinds of sites or portions of sites will or won't be part of the deep web. There are several factors like which sites replicate some of their content in static pages, which sites replicate their content completely. And also, another factor that decides is that search engines can change their policies on what to include and exclude.

Navigation: With the exponential increase in the content stored in deep web, it has become essential to develop web search technologies to effectively navigate the difficult terrain of deep web. Some companies like Flipper (www.flipper.com), FindArticles (www.findarticles.com), etc have developed software that penetrate and provide access to hidden information in deep web (McGuigan, 2003). The best way to explore the deep web is to start from using specific search engines, directories (Resource Discovery Network), subject portals and perform a search using combination of such tools.

Content: The content available in deep web is very diverse. Some of the categories of content are: Public Company findings, customized maps and driving instructions, clinical trials, patents, out of print books, library catalogues, authoritative dictionaries, environmental information, historical documents, company directories, searchable subject bibliographies, job postings, product catalogs, art galleries, etc. (Bergman, 2001).

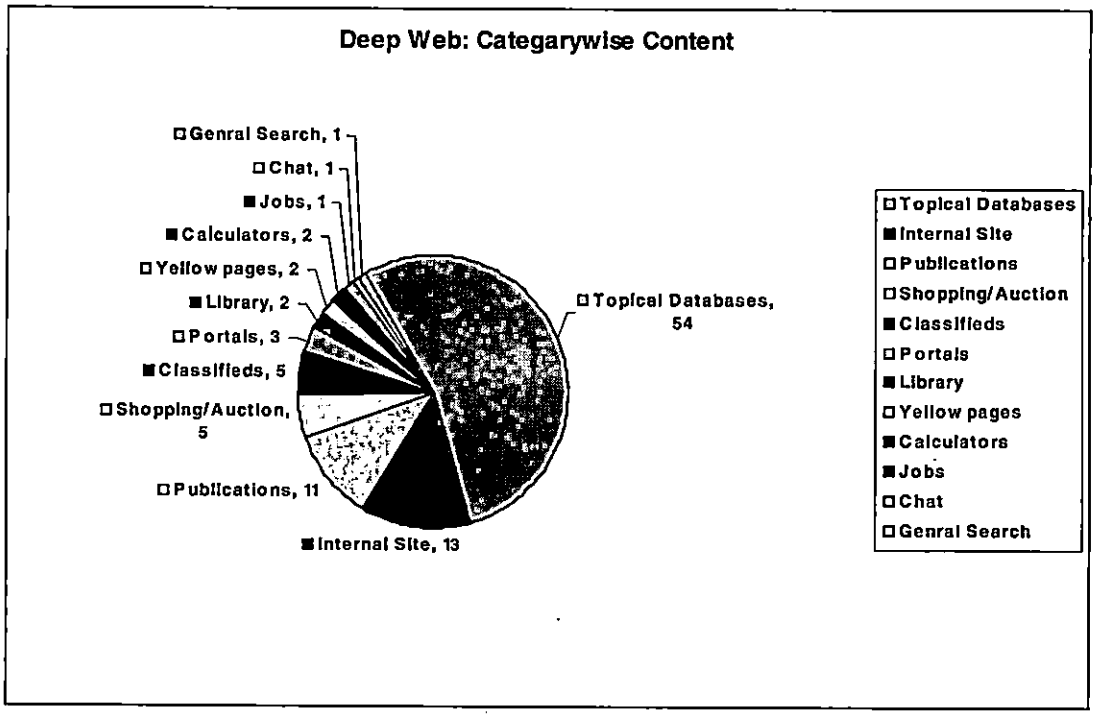


Fig. 1: Category-wise Content at Deep Web (Percentage)

4. WEB AND INFORMATION LITERACY

Much has been written about how the information Communication Technology (ICT) has created an 'Information Revolution'. At the beginning of the 21st century enormous changes are occurring in higher education throughout the world as a result of developments in ICT and its increasing penetration in information management. The quantity of information that is available now is enormous. In spite of this, a researcher can still miss the most authentic information because he was not aware of its deep web status or he did not use the correct tool to discover the resource. In today's cutting edge research, such unsuccessful and incorrect attempts at resource discovery can make or mar the project. Hence, it has become all the more significant to create awareness among users about the evolving deep web and the best available ways to retrieve the hidden information in it.

Information literacy is seen by librarians as a key requirement in accessing and making appropriate use of the vast amounts of information now available to students, researchers and faculty through internet (Wallace *2007*). With the increasing use of web based information resources, the search process has become little complicated and requires some level of expertise and skills. This is more so in case of deep web resources, as the generic search approach may not yield satisfactory results. Faculty and teachers need to acquire new sets of specifically designed information skills to access the hidden information in deep web.

New learning communities are evolving based on the necessity that learning must be continuous at all levels and ages, and must include resource based learning (*Wallace*, **2007**). Schools and universities

need to teach their students to integrate the deep web information skills into their learning process, which will benefit them for the years to come.

4.1. Exploring deep web with information literacy

Academic librarians play a major role in all these ICT induced educational changes. They provide an appropriate information environment and enable the user with necessary skills to explore the digital information environment. As the internet becomes increasingly important as a resource for learning and teaching, students and lecturers will benefit from developing the skills required to use it (*Vezzosi, 2007*). This article makes an effort in suggesting curriculum for a information Literacy skill course specifically for deep web resources.

5. CURRICULUM FOR INFORMATION SKILLS TO EXPLORE DEEP WEB RESOURCES

Information literary is a cumulative process, and the speed at which these skills have to be developed will vary according to the level, nature, competency and requirements of the users. Students within any group will come with different skill sets and hence it may be difficult to design a curriculum which fits for all (*Godwin*, **2003**). However, the, authors have made an effort to design syllabus/curriculum for a programmee "Information Literacy for exploring deep web". It is hoped that this syllabus is simple enough for those with average competency to catch-up with others effortlessly and also advanced enough to capture the attention and interest of advanced users of internet.

Level 0	Overview of Internet, World Wide Web, Surface Web and Deep Web Understanding of Deep Web, its significance and need to use resources hidden in Deep Web/Invisible Web
Level 1	Ability to select most appropriate search tool, distinguishing between databases, directories, gateways and search engines, etc.
Level 2	Awareness about different Deep Web Directories, Deep Web Databases, Gateways/Portals
Level 3	Ability to formulate Search Strategy using Boolean Search techniques, awareness and use of different levels of searching databases, use of truncations
Level 4	Critical skills in assessing search results for relevance, bias, currency, accuracy and comprehensiveness
Level 5	Ability to keep basic records of searches made and resources found, compliance with copyright and plagiarism rules, ability to create bibliography of resources used.
Level 6	Understanding that existing information can be combined with original thought, experiment and analysis to produce new information, use of mailing lists, discussion groups, newsgroups to obtain and exchange information about deep web resources.

6. CHALLENGES FOR IMPLEMENTATION

By the experience of what happened when library staff tried implementing information skills training, authors anticipate a number of challenges blocking the successful implementation of specific information literacy programme for deep web.

Lack of Appreciation: Foremost challenge has been the lack of appreciation and ignorance shown by the teachers and students. There perception is that popular search engines like Google, Cuil, and

AltaVista are good enough to retrieve information on internet and they do not need any more training for that.

***Ignorance about Deep Web*:** Deep Web/Invisible Web still appears to be an alien world for most of the faculty and students. On several occasions, the mention of Deep Web has drawn blank responses from the library users. When users are not at all aware of the Deep Web, then how will they realize what they are missing by not exploring deep web?

***Lack of commitment from the institutions*:** Design, developing and finally implementing information literacy programme several commitments like administrative and financial commitments from the institute. Many a times, institutes shy away from this.

***Non compulsory nature*:** The universities and other institutes of higher learning do not accord much importance to information literacy and hence hesitate to integrate these courses as compulsory papers into the teaching programmes. This leads students not to enroll for the information skills courses. Worse still, even if library persuades them to enroll, they may not turn up and drop midway owing to one of the other difficulties.

Lack of committed and trained manpower: Designing, Conducting and sustaining an Information Literacy Programme on a minute area like Deep Web requires highly committed and trained manpower. With the increase in the number of courses and the students, libraries are already understaffed. In such scenario, sustaining such a programme will be a difficult task.

Varying Models of Delivery: The library user groups comprises culturally, economically, sociologically, educationally diverse group, it becomes to agree upon one mode of delivery for information literacy. This problem is compounded by drastically varying levels of competency among users. Libraries will have to use a combination of workshops, orientations and self directed web based course packages to impart skills about deep web.

7. EVALUATION FOR CONTINUOUS IMPROVEMENT

It is in the best practice of library to evaluate, rethink and continuously make efforts to make information literacy programmes more responsive to the changing needs of learning environment. The suggested parameters are for those who are involved in developing, assessing and improving information literacy programmes related to internet and deep web. The evaluation is usually done by collecting feedback through surveys and interviews. The audience for survey might include all stakeholders like faculty, librarians, students and administrators and all those involved at the institution level.

Parameters for evaluation

- Suitability of mission statement, goals and objectives
- Detailed Planning about of the content, delivery and audience including human and financial support
- Administrative and institutional support
- Articulation with the curriculum
- Collaboration among faculty, library staff, students and administrators
- Pedagogy

The evaluation establishes the process of ongoing planning/improvement of the programme, measures directly progress toward meeting the goals and objectives, integrates with course and curriculum assessments as well as institutional evaluations and accreditation initiatives

8. BRIEF LIST OF DEEP WEB DIRECTORIES

The Table 1 lists out select list of deep web directories that can be searched when searching for the information on web. However, web is a dynamic environment which is continuously evolving with hundreds and thousands of resources getting added to it everyday. Hence, this is only an indicative list which needs to be supplemented by different searches on the web.

Table 1: Brief List of Deep Web Directories

Invisible web directory	URL
All Search Engines	www.allsearchengines.com
Argus Clearinghouse	www.clearinghouse.net
Beaucoup.com	www.beaucoup.com
Big Hub	www.thebighub.com
BUBL	http://link.bubl.ac.uk:80
Complete Planet	www.completeplanet.com
Digital Librarian	www.digital-librarian.com
Direct Search	www.freepint.com/gary/direct.htm
FindArticles.com	www.findarticles.com
Government Information	http://library.nps.navy.mil/home/unlinked/deepweb/deepweb.htm
Infomine Multiple Database Search	http://infomine.ucr.edu
Internet Public Library	www.ipl.org/ref
Invisible Web	www.invisibleweb.net
Invisible Web Directory	www.invisible-web.net
Librarians' Index to the Internet	www.lii.org
Libraryspot.com	www.libraryspot.com
Look off	www.lookoff.com
Lycos Directory of Searchable Databases	http://dir.lycos.com/Reference/Searchable_Databases/
Profusion	www.profusion.com
Science.gov	www.science.gov
Search Bug	www.searchbug.com
Search Engine Colossus	www.searchenginecolossus.com
Subject Directory of Search Engines	www.search.com/subjects
WWW Virtual Library	http://vlib.org/Overview.html

9. CONCLUSION

Searching the surface web is very easy and for most of the day to day information requirements, surface web still remains the first and foremost choice. However, deep web is even more valuable and dynamic source of information for the serious academic users. Since a large portions of the web resources are not covered in surface web, no academician can afford to miss on the critical information that deep web hosts. It is because of this significance that the deep web has gained lot of importance in the present internet based learning environment.

All the major institutions of higher learning already have information literacy programmes for teaching internet and web resources. But what is the need of the hour is an exclusively designed programme

that will demonstrate and teach the advanced information skills needed to explore the deep web resources. In this regards, there is a ned to work more on the curriculum of course on deep web and to devise means and ways to overcome the challenges that universities are facing in implementing such information literacy initiatives.

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Use of Web Resources by the LIS Professionals Working in the IT Based Corporate Libraries in Chennai, Tamil Nadu: A Survey

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Abstract: The use of web resources is a rising and vital trend for acquiring and disseminating the information by the library and information professionals. The corporate libraries have experienced a huge growth in utilizing the web resources than the past. To meet the requirement of the IT professionals the corporate libraries are equipped with the state-of-the-art facilities to information storage and retrieve purpose. This paper presents the purpose of using the web resources, basic types of web resources, stages in using web resources, problems in using web resources, the data collected from the library and information professionals were analyzed and presented.

1. INTRODUCTION

The invasive nature of the World Wide Web, and the immeasurable information available every were, challenged to bring immediate access to the world's information to every user of the web. The need for the information is changed time to time, due to the advancement in all the areas and the Information Technology field is not an exception.

According to Maness, Jack M (2006) in his article concluded that , the library's services will change, focusing more on the facilitation of information transfer and information literacy rather than providing controlled access to it: and libraries must adapt to web 2.0, much as they did the web originally and must continually adapt for the foreseeable future. To adapt to this web 2.0, library and information professionals need the awareness on web resources and Information Technology. Without using the web resources he/she will not be able to cope up with these trends. There is a need to use the web resources to enrich the knowledge on present trends.

Dodge, Berie (1995) explained about the WebQuest, and defined that it is "an inquiry-oriented activity in which some or all of the information that learners interact with comes from resources on the internet, optionally supplemented with videoconferencing. If the library and information professionals are aware about the webquest, he /she can acquire and disseminate the information to the user at maximum level and the time of the library staff and user will be saved.

In this present epoch when libraries in the IT companies have become connected to the Internet, library and information professionals are struggling to decide the techniques and tools to use, so as to find and make use of the information sources available through the Internet. Even though published facts suggest that many library and information professionals' approaches have changed in recent years. One informal assessment revealed that many collection development librarians now welcome the substitution of online resources for print (Landesman, Margaret: 2002). Julia K. Nims and Linda Rich used the Search Voyager feature of Magellan, an online guide to the Web, to examine student search techniques and found that problems caused by poor search strategies were magnified when they are conducted on the Web. The same situation may happen to the library and information professionals

also. In this scenario the library and information professionals must have the ability to use and manage the web resources.

2. PURPOSE OF USING WEB RESOURCES

- To identify the resources on the web
- To become aware on the web resources
- To evaluate the web resources for the library users
- To become aware and to implement the gateways and virtual libraries
- To enrich knowledge on acquisition , information storage and retrieval, and dissemination of the web resources
- To improve the IT skills and to facilitate in providing information (web resources) for the library users
- To know the state-of-the –art facilities in the library field

3. BASIC TYPES OF WEB RESOURCES

Web resources have three basic types

1. Descriptive type,
2. Functional type, and
3. Interconnective type.

The three resource types are mutually independent to each other. The descriptive type are static content, data resources , the functional type are dynamic behaviour, service resources and the interconnective type are interconnective link, links resources. Due to the independent nature of the these three type of resources, we need to have varied quality and quantity measurement for each of the individual type of Web resources.

4. STAGES IN USING WEB RESOURCES

The stages in using web resources have been divided into six:

Initiating : To start browsing the Internet to find resources in the web
Identifying : Finding the resources published in the Web
Differentiating : Comparing the resources available in the Web and their need
Selecting : Selecting the resources according to their need
Verifying : Verifying the resources published in the Web
End Using : Finally the web resources are used to attain the need

5. BARRIERS IN USING WEB RESOURCES

- Some of the web resources are too costly
- Resources are difficult to adapt to the needs
- Content trust on the published web resource

- Resources are not available in standard formats
- Internet Connection Problems (e.g., Speed, Reliability)
- Limited access to the Internet
- Printing Problems
- Problems with Computer Hardware and Software
- No Support from Colleagues or Superiors or from management
- Lack of fund

6. PURPOSE OF THE STUDY

Web resources are popular. The possible reasons for this could be because of the Internet. The use of web resources by the library and information professionals were not yet matured than others in India and this need to be changed and the awareness of web resources needs to be raised. The purpose of this study is to investigate the use of web resources from library and information professionals perspectives in the IT companies located in Chennai.

7. DESIGN/METHODOLOGY/APPROACH

This study involved an e-mail questionnaire to survey the library and information professionals working in the IT companies located in Chennai using the web resources. The questionnaire circulated to the library and information professionals during July 2008 . A reminder was sent again during the first week of August 2008 to acquire more responses.

8. DATA ANALYSIS

An attempt has been made to describe and discuss the results of the present study based on the analysis of data, collected from the 37 libraryians from IT company libraries located in Chennai. 200 questionnaires distributed, who were included in the sample and the response rate is 18.5%.

8.1. About the Company

8.1.1 Year of Library Establishment

Respondents were asked about the establishment of their library. The replies are tabulated and given in the table 1.

Table 1: Year of Establishment of the Software companies

S.No.	Year of Establishment	No. of Companies
1	1980-1985	8 (22%)
2	1986-1990	6(16%)
3	1991-1995	5(14%)
4	1996-2000	11(30%)
5	2001-Till Date	7(19%)
	Total	37 (100%)

It is evident from the table 1 that majority 30% of the IT companies were started during the year 1996 to 2000, following that 22% were started in the year 1980 to 1985, 19% were started in the

year 2001 to Till Date, 16% were started in the year 1986 to 1990 and only 14% were started during the year 1991-1995.

8.2 About the Library

8.2.1 Library Working Days

A question has been asked to know the working days of their library and the replies are given in the table 2.

Table 2: Library Working Days

S.No.	*Library Working Days*	*No. of Libraries*
1	On week days	23 (62%)
2	On Saturdays	11 (30%)
3	On Sundays	2(5%)
4	On Holidays	1(3%)
	Total	**37 (100%)**

Table 2 reveals that majority 62% of the Libraries are working only in week days, following that 30% were opening the libraries on Saturdays, 5% were opening on Sundays and only 1% were opening on Holidays.

8.3 About the Library and information professional

8.3.1 Gender

A question has been put forwarded to the respondents to know the gender. The replies are analyzed and presented in the table 3

Table 3: Gender of the Respondents

S.No.	*Gender*	*No.of Respondent*
1	Male	21(57%)
2	Female	16(43%)
	Total	**37(100%)**

Table 3 presents the gender of the respondent, majority 57% were male and only 43% were female.

8.3.2 Age of the Respondents

A question has been asked to the respondents to know the age. The replies are analyzed and presented in the table 4.

Table 4: Age of the Respondents

S.No.	*Age*	*No.of Respondent*
1	20-25	21(57%)
2	26-30	10(27%)
3	31 and above	6(16%)
	Total	**37(100%)**

It is evident from the table 4, majority 57% of the respondents are in the age between 20-25 following that 27% were in the age between 26-30, and only16% is in the age between 31 and above.

9. USE OF INTERNET

9.1 Frequency of using internet

A question has been asked to the respondents to know the frequency of using the Internet. The replies are analyzed and presented in the table 5

Table 5: Frequency of using Internet

S.No.	*Frequency of Internet Use*	*No. of Respondents*
1	Daily	21(56%)
2	10-50 times a week	11(30%)
3	10-50 times a month	5(14%)
	Total	**37(100%)**

Table 5 presents that, majority 56% were using the internet daily, following that 30% were using 10-50 times a week, only 14% were using 10-50 times a month. The diagram-matic representation is given below.

10. WEB RESOURCES USAGE

10.1 Search Engines Usage

A question has been asked to the respondents to know the usage level of Search Engines while browsing the Internet. The replies are analyzed and presented in the table 6

Table 6: Usage of Search Engines

S.No.	*Search Engines*	*Used*	*Not Used*	*Total*
1	Alta Vista	17(46%)	20(54%)	**37 (100%)**
2	Excite	9(24%)	28(76%)	**37 (100%)**
3	Google	36(97%)	1(3%)	**37 (100%)**
4	HotBot	13(35%)	24(65%)	**37 (100%)**
5	Info Seek	8(22%)	29(78%)	**37 (100%)**
6	Lycos	11(30%)	26(70%)	**37 (100%)**
7	Met Crawler	3(8%)	34(92%)	**37 (100%)**
8	MSN	12(32%)	25(68%)	**37 (100%)**
9	Yahoo	35(95%)	2(5%)	**37 (100%)**

Table 6 presents that, majority 97% were using the Google, following that 95% were using Yahoo, other search engines are used less in amount by the respondents. The diagrammatic representation of Search Engines usage is as follows.

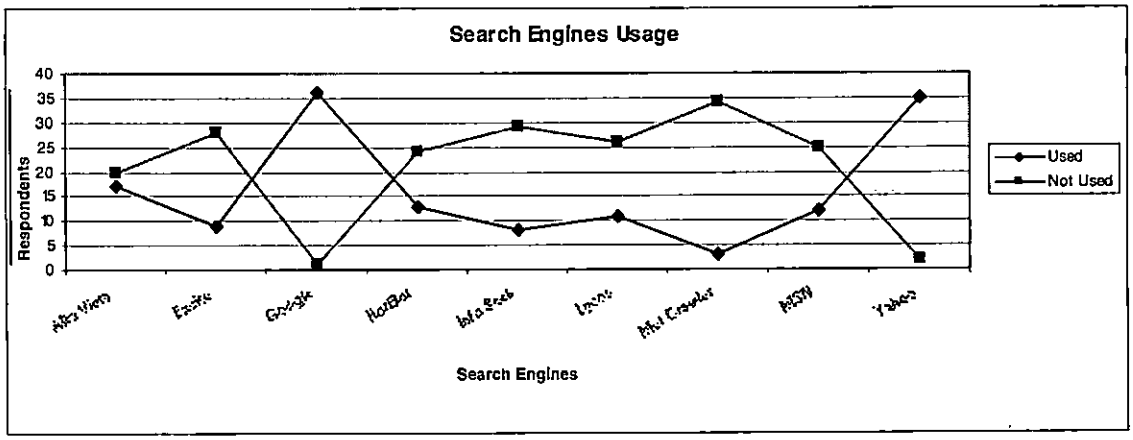


Fig.: 1 Usage of Search Engines

10.2 E-Books/E-Journals/E-Databases Usage

A question has been asked to the respondents to know the usage level of E-Books, E-Journals and E-Databases in the Web. The replies are analyzed and presented in the table 7

Table 7: Usage of E-Books/E-Journals/E-Databases

S. No.	*Web Resources*	*Used*	*Not Used*	*Total*
1	e-books	21 (57%)	16 (43%)	**37(100%)**
2	e-journals	31(84%)	6(16%)	**37(100%)**
3	e-databases	17 (46%)	20 (54%)	**37(100%)**

Table 7 reveals that, majority 84% were using the E-Journals and only 16% were not used, following that e-books were used 57% and 43 % were not used, and E-Databases were used 46% and 54% were not. The pictorial representation is given below.

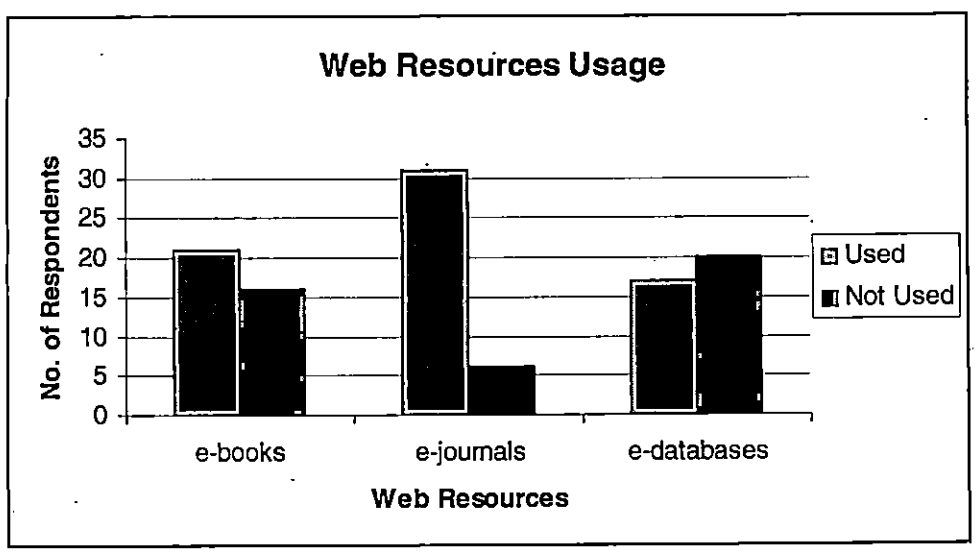


Fig.: 2 Usage of E-Books/E-Journals/E-Databases

11. DISCUSSION

Based on the analysis, Google 97 percent and Yahoo 95 percent more use than the other search engines to search the web resources. In addition, the popularity of search engines may increase and the IT companies provided the Internet connection to the library to meet the needs of the users and the library and information professionals. When compared to the usage of e-books, e-journals and e-databases. The e-journals were used more than the other resources by the library and information professionals.

12. CONCLUSION

In this present scenario the web resources plays a vital role. One of the most valuable ways to find useful information, the library and information professionals working in the IT companies has to participate in professional societies, associations and user groups and have a chance to learn enormously helpful information from web.

Current experience suggests that library and information professionals will have to spend an increasing amount of their time in the electronic frontier. Many scope and properties of this electronic frontier is unknown and uncharted province and our survival depends on well we adapt our values and skills. In this trend the library and information professionals has to use the web resources effectively and enrich their knowledge to meet the challenge.

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Value added Information services in digital environment: Application of RSS feed

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Abstracts: The paper presents aspects of digital libraries and the use of tools and techniques of RSS feed. It also compares the services provided by corporate library (KC, RIL) and academic library (TISS). Academic and corporate libraries have differences in their collection, number of users and professional staff. But, when both provide information service, they have to use latest technology and continuously upgrade their services. Both libraries can meet the expectations of their users with help of web2.0 technologies like blog, RSS feed and wiki. This paper focuses on how RSS feed can be used to add new and upgrade existing information services, in both the libraries. Practical and managerial aspects for implementation of RSS feed are also discussed..

Keywords: RSS Feed, Information Services, Academic Library, Corporate Library

1. INTRODUCTION

Information professionals have continuously adapted latest technology as and when they had the opportunity to use them. Hence, the information services provided by the libraries in industrial era or post-industrial era, up-to the present knowledge era have shown a positive growth. Over the years, academic libraries acquired unique features like huge collection of both print and non-print material on wide range of subjects and cater to large number of users. Often due to paucity of funds, information professionals in academic libraries have to provide better services with the same resources. Comparatively, corporate libraries have received reasonable funds but lesser professionals to man the services provided. Hence, both have been finding novel ways to render value added services to their users. In the 'information revolution' brought by Internet, web 2.0 technologies have been of great use to the information professionals. RSS technology, a feature of web2.0 technology provides many options to make the users aware that the information centres are designed for their specific needs and capabilities. Adding new value added information services and rendering earlier services in effective ways is possible with the use of RSS feed. Posting information about events, announcements, new additions, etc. helps users to stay updated. In short, current awareness service and selective dissemination of information can be provided with the use of RSS feed.

2. COLLECTION AND SERVICES IN DIGITAL ENVIRONMENT

2.1 TISS Library and RIL-RTC-Knowledge Centre

TISS is one of the premier institutes in India in the field of Social Sciences catering to the educational and research information needs of academic and scientific community. Sir Dorabji Tata Memorial Library (SDTML) is a unique Knowledge Centre, which has been offering information resources and services to social scientists for over a century. Its main aim is to provide seamless access to social science information to users in a networked environment by creating digital content in the field of Social Sciences. Currently it caters to more 1000 of users.

Reliance Industries Limited (RIL) – Reliance Technology Centre (RTC) – Knowledge Centre (KC) is a corporate research information centre catering to scientists working on 'Polyester Research'. Timeliness and confidentiality of information are the unique features found in the research centre. Knowledge Centre houses information resources both in print and non-print format since 1997. Currently, it provides information services to about 50 RTC members and many others across RIL.

TISS library has information sources over 1.8 lacs as print documents (books, thesis, course compendiums, etc). Besides subscribing to print version of 280 unique journal titles, it has 8000+ journals with full text access under the UGC-INFONET Consortia and access to 3000+ fulltext subscribed online journals like Sage Journals Online, Emerald Management Xtra, India Stats.com, World Bank Resources, and ABI/INFORM. Access to more than 50 e-books is given via library's institutional repository website using the open source software D-Space. Library has major offline CD-ROM databases like Proquest, ABI inform, Popline and Wilson Social Science Abstracts, which can be accessed through the CD Server, installed within the library.

Collection in KC-RIL is different from TISS library. Stress is more on e-formats and latest information. Apart from 550 books and 50 unique journal titles, information sources like standards, patents, conference proceedings, reports, instrument catalogues and newspaper clippings are also available. KC also subscribes to about 40 online journals including back files of select titles. KC has more than 60 CD-ROMs. Indian and foreign standards, patent database, conference proceedings, and training material are available on CD-ROM. All the information sources are focused on 'Polyester and related topics'. RTC members access these resources via RTC portal. KC users also have access to information sources available at 7 libraries attached to learning centres and 5 libraries attached to research centres across RIL. This works like internal consortia. Hence, users get access to large number of digital resources. KC has subscribed to online databases like Delphion, Scifinder and STN.

In spite of the differences, digital collection in both the libraries can be grouped as follows:

a) Subscribed / licensed collection – *online journals, e-books, standards, databases*

b) Internally (in-house) developed collection – *special bibliographies, e-bulletins* and

c) Freely (open access) available material via Internet – *online journals, e-books*

Options to retrieve information at TISS library includes –

1) TISS library (*only to registered library members and institutional members*)

2) Location specific Intranet (*visible to users of TISS, Deonar, Mumbai website*)

3) TISS Website www.tiss.edu (*visible to all branches of TISS and Internet*)

Options to retrieve information (RIL-RTC-KC) includes –

1) RTC Portal with basic search features (*only to RTC members*)

2) Location specific Intranet (*visible to users of Patalganga site*)

3) RIL Intranet (*visible to all sites of RIL*). (RIL has a separate website www.ril.com that is accessible on Internet)

Both TISS library and RIL-KC users have two options to retrieve digital information — a) IP based access and/or b) Login Id and password. This mainly depends on the options given by the publishers and database owners selected by the library.

TISS started digitisation work in the year 2000. Digitisation work was initially started with the purpose of preservation and then extended to enable access to some important in-house publications

like theses, TISS reports, monographs, convocation addresses, annual reports and other publications brought out by the faculty. Besides these important documents, digitisation is also done for rare books, out of print books and course compendiums. Three digitised products prepared by TISS library are:–

1) Parsi Literature (stored in Pdf format)
2) Sociological Bulletin (55 volumes comprising approx. 15,000 pages)
3) Indian Journal of Social Work is being digitized from vol. 1, no. 1. So far, about 65,000 pages are digitized.

KC-RIL has not started with digitisation work. But, have many in-house publications that are in soft copy form. In-house compilations like 'Polyester digest' 'Patent Alert' and 'Polyester News' are published on monthly basis. It also has many knowledge products that include research reports and presentations prepared by their users. These products are in digital format. KC also functions as Patent Co-ordination Cell for patents filed by RTC.

Both the libraries also have archival collection developed in-house by their users. Though the subject content of each library is different, forms and formats of the collection remain same. There is selective use of these resources. Information professionals can use latest technology to improve the usability of under utilized resources.

Studying the information seeking behaviour of users, in both the libraries, reveals that the search strategy adopted by the users is:

a) Use of search engines like Yahoo and Google to locate information on Internet
b) Subscribe to e-alerts – to keep abreast with latest developments
c) Periodic visits to favourite web sites - for information relevant to their interest

Users' feedback indicates that search on Internet often gives too many hits. Narrowing the search to retrieve relevant information becomes a time-consuming activity. Subscribing to e-alerts also tend to have information overload filled with lots of junk mail. Visits to favourite web sites to locate relevant information is also time consuming. Hence, users of both the libraries expect value added information service.

Currently both the libraries provide WEB-OPAC and circulation service to their users via readymade software packages installed on their website. TISS library has Slim++ while KC-RIL has LibSuite. Both these packages have in-built features of CAS and SDI. But, both are limited only to new resources added in these packages. Users require more than these simple forms of CAS and SDI.

In both the libraries, users expect to access all resources via a single website. They expect organized alerts with reference to latest information in their field, with a single click. Users expect that irrespective of the format of resources, availability of an information source and a common search for all the resources should be possible via a single website.

3. NEED FOR APPLICATION OF RSS FEED

Information professionals need tools to find relevant information and provide value added service to their users. RSS is one of the many emerging content creation and management tool that information professionals can use to simplify the process of finding and rendering information service.

Information professionals can make use of RSS feed in two ways:

1) Subscribe to RSS feed: Use RSS aggregator to extract information from a web log or RSS feed of other web sites.

2) Generate RSS feed: Incorporate RSS feed on library web site to provide information service to their users.

Users too can benefit from the RSS feed option. They can set a preference by subscribing to select RSS feeds of their interest. Users can save lot of their time spent in browsing and navigating web sites for relevant information.

Irrespective of the type of library, general benefits of RSS feed are:

- Saves time of the user, especially to locate information. Libraries can subscribe to RSS feed of other web sites. Filter the required feeds, organize the feeds and then add on their library web site.
- Increase visibility of the information resources, even those that are available at different locations.
- Improve the positioning of services offered via RSS feeds. This will help to convert potential users to regular users.
- Internet News is abundant, but finding specific information is tough. RSS feed can be used to provide "one-hit access" to the users for latest news.
- With help of RSS feed the users are free from the hassles to remember navigational modes of the website.
- Launching new information products is simpler with RSS feed.
- RSS feed can be used to broadcast information on Intranet or Internet.

4. APPLICATION OF RSS – PRACTICAL ASPECTS

Really Simple Syndication (RSS)

RSS feed defines a format to share data via web sites. Information provided by a website in an XML file is called an RSS feed. Netscape were the creators of RSS in 1999. But others like O'Reily and Dave Winer improved later versions. Visit to www.xml.com, www.dmoz.org, wikipeadia and other web resources provide details about the basic concept of RSS feed including its history. The latest version of RSS feed ver 2.0 is defined by Harvard (http://cyber.law.harvar.edu/rss/rss.html). RSS feed is a general term used for several variants known as XML feed, Atom feed or Web feed.

RSS Feed Structure

RSS document is an XML file with at least one channel that is the website which provides the information. Channel contains many sub parts. Links to web pages are included in 'item'. Brief description of these links are also available. Web pages may be from the same site or from other sites.

Simplest structure of RSS feed

<rss>
<channel>
<title>name of the website<title>
<link>url of web site<link>
<description>...some text describing the website...<description>
<item>

<title> title of the information service< title >

<link> HTML of the web page < link>

<description> ..some text describing the web page..<description>

<item>

<channel>

<rss>

There are variations in the basic format as per the standard adopted by a web feed. More items can be added in the description of the web feed. But, older items are to be removed and deleted or archived. Other details like description of the web page, owner of the web site, date, and language in which it is displayed may or may not be added in the RSS feed structure. But, a well-structured RSS feed has these standard parts which shows that the information content is from an authentic and qualitative source. Many publishers like Oxford, Elsevier, and Wiley; libraries and library consortia like OCLC, New York Public Library, and South West Hampshire Health Library; and library blogs like www.libdex.com/weblogs.html#us have RSS feed on their website. Study of these RSS feeds will help in designing RSS feed.

Points to consider prior to practical applications of RSS

The web site on which the RSS feeds are to be uploaded should be flexible to accommodate variety of standards. RSS feeds selected for subscription may have different standards.

Select a RSS reader as per the requirement. RSS feed readers (aggregators) may be classified into two groups. Web based feed reader and Desktop based feed reader. For example, Bloglines is a web based feed reader that automatically deletes the earlier feeds on periodic basis. NewsGator is a desktop based feed reader that saves earlier feeds unless specified otherwise. If RSS feed has to be used for SDI service, select software like Word Press platform that allows making categories of RSS feeds as well as drawing relations between the categories.

If users are permitted to tag their comments, then precaution is essential. Prevention of trackback and comment spam is possible with various options of plug-in features for comment moderation. For example Wordpress plugin that blocks attempts to post spam is called bad behaviour http:// www.ioerror.us/software/bad-behavior/. There can be a policy document suggesting approximate length and contents of comments.

Policy related to maintenance of RSS feed - updating, deleting and /or archiving has to be carefully documented.

Steps to be followed for practical application of RSS feed

Either information professional can upgrade their technological knowledge or take IT support to follow these steps.

1) Design web pages. Use these web pages as information content for RSS feed.
2) Prepare an XML file that defines the RSS feed. Then convert the feed to a script like PHP or Javascript for inserting into an HTML webpage. RSS conversion template available on Internet may be selected or in-house developed template may be used. Free conversion tools like www.feed2js.org for Java script or http://magpierss.sourceforge.net Magpie parser for PHP allows formatting the feed.

3) Computers (PCs) of all users should have RSS feed reader to access the RSS feed. Most of the RSS readers are available free of cost. They can be easily downloaded from Internet and used. The latest versions of Internet Browsers have inbuilt RSS reader (aggregator). Some of the RSS readers are NewsGator, FeedBurner, Bloglines, Feedreader.

5. IMPLEMENTATION OF RSS – MANAGERIAL ASPECTS

Users will accept information services only if their needs are satisfied. Hence, irrespective of the technology used, it is imperative to first identify the information needs of all categories of users. Methods like user surveys, one-to-one interactions and study of user's feedbacks for exiting services will give an insight on user's information needs. Services can be planned keeping in view the real needs rather than the perceived needs. Finding out the user priorities will help in planning the priorities in which new services can be launched.

Prior to adopting RSS technology, some preliminary preparations like training information professionals and drafting a plan document with help of an advisory committee will help to achieve success.

Training of Information Professionals should cover topics like –

1. Understand the basic concepts of RSS feeds
2. Understand the policy governing the contents of RSS feeds
3. Procedure for subscribing to RSS feeds and selecting relevant topics for RSS feeds
4. Generating RSS feed may be done by information professionals with help of IT experts.

Guidelines for an information product, by answering five Ws (Why What, Who, When and Where), will help to plan a user-centred design. Why is the information product needed? What is the scope and limitations of the product? Who will update the information content? When will new content be added and when earlier content deleted or archived? And Where will the RSS feed be positioned?

An advisory committee comprising representatives of users, library professionals and IT members will be beneficial for proposing information services that can be provided with RSS feeds. Participation of users in advisory committee will not only ensures appreciation of services offered but will help in promoting the services to other users. Expertise of IT team is required in selecting the hardware and software tools for hosting information services.

Organizations have already invested in LAN infrastructure and desktop tools for users. Hence, only the incremental investment for information access tools to provide services should be mentioned for budget approvals.

6. USE OF RSS FEED FOR LIBRARY AND INFORMATION SERVICES

RSS (Really Simple Syndication) is an XML feed that streamlines content syndication. In other words, it's a way to subscribe to websites, and elements of websites, that a user wishes to receive on an ongoing basis. An RSS aggregator or feed reader is required to operate RSS Feeds. A useful list of RSS readers can be found at— http://allrss.com/rssreaders.html. Use of RSS feeds is not limited to blogs, news sources, or commercial Web sites. An increasing number of libraries have also begun to offer RSS feeds to promote and extend their services.

From information professional's point of view, RSS is a simple way of collecting news uploaded on various websites in a format that computers can process. The collected information can be filtered, organized and then displayed on a website for the users. This feature of RSS can help information centres to provide Current Awareness Service in novel ways. Information professionals can also use RSS to create information content and let users select and subscribe only to what they need. This feature of RSS can be used to provide Selective Dissemination of Information to users. Here, the user profile can be handled by the users and modified by them as per their choice.

Services provided through RSS feed can be mediated by information professional or controlled by each individual, enabling them to choose from the options available. Please refer table-1 for services currently provided by both the libraries. The same table also mentions application of RSS feed for each service and benefits to the users.

Table 1: Library services: Present use and future improvement.

Services	*TISS*	*KC-RIL*	*Use of RSS Feed*	*Benefits to users*
List of additions – any media type	a) via WebOPAC b) bi-monthly c) sent by e-mail d) library website	a) via WebOPAC b) bi-monthly c) sent by e-mail d) library website	Media type can be categorized	Feed can be displayed on Intranet (also on different websites)
Table of Contents - Journals	—	—	Subscribe to publishers' RSS feed	Upload on library website
Journal articles	a) Subjectwise categories manually prepared (only bibliographic details added) b) bi-monthly c) sent by e-mail	a) Subjectwise categories – manually prepared (abstracts are also added) b) monthly c) sent by e-mail d) Library Portal	Subscribe to publishers' RSS feed that have link to abstracts and full text and then selectively use in library's RSS feed	Users can set preferences as per their choice. Selective display on user's desktop
Calendar of Events	a) Surf Internet to locate information manually prepared b) irregular c) sent by e-mail	a) Surf Internet to locate information manually prepared b) irregular c) sent by e-mail d) Library portal	Subscribe to select websites of Institutes/ organizations then selectively add in library's RSS feed	RSS feed icon displayed on library website.Users can view latest updates as and when they want.
Special Bibliographies - On select current topics	a) Surf Internet to locate information manually prepared b) irregular c) sent by e-mail	a) Surf Internet to locate information manually prepared b) irregular c) sent by e-mail d) Library Portal	Subscribe to RSS Feed of latest News	RSS feed icon displayed on library website.Users can view latest updates as and when they want.
Alerts of special collection	Braille collection AV- collection Thesis, Flash cards, Posters, Maps Listed in WebOPAC	Patents -a) Surf selected web sites for latest Patent b) monthly c) sent by e-mail d) Library portal	Subscribe to Patents related RSS feed and selectively add in library's RSS feed	Users can set preferences as per their choice. Selective display on user's desktop
Library announcements	a) Prepared manually b) As and when needed c) Displayed on Notice Board	—	Generate RSS feed on library website	Users can view as and when they wish.

Services	TISS	KC-RIL	Use of RSS Feed	Benefits to users
User Orientation	a) Prepared manually c) sent by e-mail and displayed on notice board	a) prepared on powerpoint c) used during interactive sessions	Generate RSS feed on library website	Users can refer whenever they wish.
Journals - Holdings list	a) Report generation - WebOPAC	a) Report generation - WebOPAC	Generate RSS feed on library website	Users can refer whenever they wish.
New Publications for selection (documents received on approval)	a) intimation by e-mailb) irregular c) displayed in acquisition section	a) intimation by e-mailb) irregular c) displayed on special table	Subscribe to vendor's/ publisher's RSS feed and selectively add to library's RSS feed	Users can view whenever they have time and tag their recommendations online.

a) Methodology followed, b) Frequency, c) Mode of dissemination, d) Position of display.

Use of RSS feed for Current Awareness Service

Both the libraries can generate RSS feeds on following topics:

1. News and announcements - RSS feed
2. Events - RSS feed
3. Institutes / Companies (competitors)– new developments - RSS feed
4. Products / services offered - RSS feed
5. New information sources added in the collection - RSS feed
6. Instructional and reference service - RSS feed

Benefits to information professionals are that their website will not stay cluttered with blogs or news items. Just an icon of RSS feed is sufficient. Libraries can subscribe to RSS feed of electronic journal vendors and publishers, filter the content and then provide relevant information to its users. Ingenta Connect offered by Ingenta Inc. and ABI inform offered by Proquest are notable examples of a vendor service, providing web feeds for each of its more than 28,700 journals.

Users require the latest information in their chosen research areas. Speed and relevancy can be achieved using RSS feed for alerting services. RSS feed supplements alerting tools. Hence it is less time consuming than periodically visiting selected websites, navigating through it and searching for relevant information. Users could choose to receive desktop notification for newly-published journal of their interest. Some feeds show the latest issue numbers and dates together with a link to the full table of contents.

Use of RSS feed for Selective Dissemination of Information

SDI service can be provided by subscribing to other RSS feed and selectively including it on the library website. SDI service can also be provided by generating RSS feed to include in-house information. Once a thesaurus like structure is prepared, information available in any form and format can be collected on selected topics. In case of RSS feed based SDI service, user can select any topic of their choice. User can click on the RSS feed icon and read the new information added in that category. Users can subscribe or unsubscribe a feed as and when they like. Users can manage their SDI service according to their own preferences and research needs. Users can become more self-sufficient in managing and locating the current information.

Apart from CAS and SDI – Knowledge products can be organized and RSS feeds can be used for making users aware of such products. Both TISS library and KC-RIL have lots of material in forms that are never formally published but the information can be of great value to its users. Such information can take form of knowledge products, for example 'Minutes of Meeting' and 'Project reports'. Such valued information can be uploaded on the website via RSS feed. This too can be kept under various subject groups but accessible to internal users only.

Users can tag their comment to information available via RSS feed. These comments can be expressed in brief. Comments increase interaction among users and in turn increase use of information sources and services.

In general, RSS is a low cost effective way to interface with the users. Since most of the software tools are available in public domain. Re-broadcasting of other RSS feeds is free of charge. There are no copyright issues involved. Software tools take care of permitting selective access to RSS feeds. At the subscribers end (users or library professionals) information is automatically updated. Multiple users can access the RSS feeds as and when they wish to view the feed. Thus, use of RSS feed is independent of time. Web sites do not get cluttered with information. Instead, they can be better designed as RSS feeds reside on the web site in form of an icon. An added advantage of online RSS feed readers is the use of blog search engines that allow users to perform keyword search.

7. CONCLUSION

Traditionally, information professionals have to provide more services with minimum resources. Even today users expect more delivery with same resources. RSS feed a feature of Web2.0 technologies have helped to render value added services with existing resources. Hence, the need for application of latest technology remains same in both the libraries. Though academic library – TISS and corporate libraries – RIL-RTC-KC have differences with reference to their collection and service, both serve research community. They need latest information preferably in organized form. RSS feed is a suitable option to satisfy this need. Bibliographies based on exhaustive searches on a specific topic are compiled for a single or small group of users. By maintaining RSS feeds for such bibliographies, other users too will be aware of these lists and use them if needed. Thus the services provided by library professionals can be utilized by maximum number of users. Both libraries also have potential users. RSS feed can help in increasing the visibility of the library collection and services. Thus the potential users too will be drawn towards use of library resources. This will ensure maximum utilization of library resources. While providing user-centric information service, information professionals too can benefit from this technology. Information professionals can share their thoughts and ideas with colleagues and bring about professional development with the use RSS feed.

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Web Based Information Sources: Special Reference to Linguistics and Languages

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Abstract: The changing dynamics of information space in the digital age has brought about profound changes in the way information is created, stored, distributed, delivered and accessed. The "Any time, any place information" paradigm of the networked environment has redefined the roles and redrawn the functions of authors, information intermediaries and end users. The fundamental mission of libraries and library profession to facilitate access to knowledge and information has remained unchanged, the process and tools and techniques employed for realizing this objective have all undergone profound transformation. The information profession has to equip itself to effectively function in this changed environment.

Keywords: Web Based Information Sources,

1. INTRODUCTION

Library and information centers are experiencing a huge transition from printed to digital collections. This has led to many changes in the traditional libraries practices as well in the roles of library and information professionals who facilitate access to and dissemination of information. The advent of electronic resources and their increased proliferation in libraries has brought about significant changes in collection development functions and roles. This has necessitated a new breed of professionals who can understand the entire electronic information scenario such as –procurement, organization, access and dissemination services to their users. The library and informational personnel are actively exploring new ways of optimizing access to electronic resource through web.

2. INTERNET AND THE WORLD WIDE WEB

The emergence of the internet is radically changing the generation, flow and utilization of scholarly information globally. The WWW, or the web, is the most popular and rapidly growing service of the internet in an information society. The web has made the internet easier to use and enhanced its value as a communication medium with its two components- web servers and web browsers. The growth in the variety and applications developed over the web has been remarkable. The relative ease which web related tools may be used to publish and access multi-media information over the internet has led to the availability of a variety of digital information sources on the internet also called as "Network Information" in the information world.

3. WEB 2.O AND LIBRARY 2.0

Web 2.0 describes the trend in the use of World Wide Web technology and web design that aims to enhance creativity, information sharing, and most notably, collaboration among the users. These concepts have led to the development and evolution of web based communities and hosted services, such as social networking sites, Wikis, Blogs Mash-ups, Peer-to-peer networking, Podcast, RSS, Web services. The Library 2.0 is the application of the concept of web 2.0 to the library world. It provides a rich, responsive user interface/establishes social networks of users with common interest and supports collaboration.

4. WEB RESOURCES

Web resources are identified with a special name called "Uniform Resource Locators (URL)", which is simply an address of document on the web or net. These identify objects that may be accessed on the web. When one needs to navigate a web page, it is done through its URLs. This describes the protocol needed to access the web page and access points to its internet location and home directory.

5. ORGANISATION OF WEB RESOURCES

The current trend in libraries is to move beyond just bringing catalogues of collection to the web, but also the content, through digitations projects subscriptions to full text databases including e-journal and e-books. This trend improves accessibility of resources for geographically remote patrons who can use the resources without having to come to the library. Organization of web resources is the most crucial issue needing appropriate attention.

The selected web resources for inclusion into library collection it is necessary to develop an organization scheme. Another important issue is hoe to present them in a way that permits users to navigate them easily and find the information they need. In order to develop a need based search technique one needs to look at the site contents and then to assign an appropriate number of subject headings followed by adding a classification number and to file it into the database. For a user making the web the part of a library's normal collection of resources promotes the ides that internet is just another source of information. Another very important factor is the existence of a web link on a library catalogue should offer some sort of validation of the information contents of that page.

No doubt web based free resources are very important for achieving academic excellence in the institutions. However, the purpose of the web resources should be carefully evaluated based on its nature such as informative, educate, entertain and content of the electronic resource are likewise of great importance, because sometimes such resources may mislead the user.

6. TPYES OF WEB RESOURCES

There are three types of web resources such as open web-Anything online that can be found freely with a search engine, the other is Gated web – Online resources accessible by subscription and lastly the invisible web-Databases that are not found by search engines and can be accessed through a particular page or front end e.g. Library of congress site American Web site http://memory.loc.org.

7. MEANS OF ACCESS TO WEB RESOURCES

One can access web resources through three means which are- through search engines, web OPACs and through specified URLs/ web sites.

8. DETERMINING FACTORS FOR WEB USAGE

Web browsing is very important for the knowledge based society. There are two important factors that make a user make the user to go the web. The most important factor that determines that web browsing practice or a user is the interest of updating of knowledge in general. Another factor is awareness of the web and it facilities: availabilities are the important to make the user to use the web. Also the significant factor is the cost of using web. The web browsing practice of a user is one of the main factor that determines of the academic efficiency.

9. WEB BASED INFORMATION RESOURCES

These resources are also known as internet information resources. Broadly these resources are categorized as below:-

- Subject Gateways
- Portals
- Online-courses
- E-Journals
- E-Books
- List serve
- Virtual conferences
- FAQs
- Online Chatting
- Web Directories
- Library catalogues-Web OPACs
- Virtual Help Desks
- Mailing Lists
- On-Bookshops
- E-mail based information services
- Usenet News
- Full Text of Documents

10. INFORMATION SERVICES AT THE CENTRAL INSTITUTE OF INDIAN LANGUAGES(CIIL), MYSORE . http://www.ciil.org

CIIL was established(1970) to coordinate the development of Indian languages, to bring about the essential unity of Indian languages through scientific studies, promote inter-disciplinary research, and contribute to mutual enrichment of languages. The Centre for Information on Language Sciences (CIIL Library) is a computerized multimedia library possessing specialized collection in Indian Languages, Linguistics, and allied areas like Anthropology, Education, Folklore, Literature, Philosophy, and Literature. Besides the print resources, the library has subscribed to electronic EBSCO database, E-Books .An effort has been made to provide web resources services along with the regular information services. These are made available on the internet and intranet which includes New acquisition of books, OPAC, Newspaper clippings, Periodicals, Repository, Theses and Dissertation, Map Archives, CD database, Current periodicals, Gratis, Multimedia, Information Sources in Linguistics and Languages, virtual library in linguistics through the library homepage site-

http://www.ciillibrary.org	Homepage
http://192.168.0.7/journal/	Current journals
http://192.168.0.7/indic/	Periodicals
http://192.168.0.7/repository	Repository
http://192.168.0.7/theses	Theses and Dissertation
http://192.168.0.7/map/index1.html	Map Archives

http://www.ciillibrary.org	Homepage
http://192.168.0.7/cddb/	CD database
http://192.168.0.7/gratis/	Gratis
http://192.168.0.7/multi_media	Multimedia
http://192.168.0.7/info_services	Information Sources in linguistics
http://www.ciillibrary.org/sites/nadd/index.htm	New acquisition of books
http://www.ciillibrary.org/mMain/virlib/index1.htm	Virtual library in linguistics

11. WEB BASED INFORMATION SOURCES: SPECIAL REFERENCE TO LINGUISTICS AND LANGUAGES

The information and communication technology allows the user to know the latest developments in their field at their convenience of location. The World Wide Web which is an information super highway facilitates the user to find the information in every field of knowledge.

Here some selected web sources of linguistics and languages are explained under various web resources-

11.1 Subject Gateways

Subject gateways are also known as subject –based information gateways, virtual libraries is an important component on information centers web site designed for the users so as to help them discover high quality information on the internet in a quick and effective way. A gateway is similar to bridge in the fact that they connect one network to another but the real distinction lies in the fact.

http://www2.lib.udel.edu/subj/ling/internet.htm	University of Delaware
http://www.library.ex.ac.uk/special/guides/subject/languages.html	University of Exeter
http://www.lib.ed.ac.uk/resbysub/englang_dbs.shtml	University of Edinburgh

11.2 Societies, Associations, Institution

http://www.lsadc.org/ Linguistic Society of America, Washington.

A useful site which provides a quick link to important information of the organization with FAQ's like" which should I major in linguistics?"/ "Why should I join the LSA?" which may be help for fresher.

http://www.linguistics.berkeley.edu/BLS Berkeley linguistics society, Berkeley

11.3 Library Catalogues Online

A user friendly online catalogue which provides the complete printed book collection fully catalogued with the navigational tools for searching the records. For most of the basic reference materials in linguistics and languages an abstract is provided with the image of the book.

http://lib.ex.ac.uk/	University of Exeter
http://www.waikato.ac.nz/library/learning/s_lingsguide.shtml	University of Waikato
http://library.georgetown.edu/guides/linguistics/#top	Georgetown University Library

11.4 Pinakes

In ancient times, the Library of Alexandria was seen as a universal store of human knowledge. As the Library grew in size, however, it became increasingly difficult to locate relevant material. The poet Callimachus solved the problem by compiling a catalogue called *The Pinakes*. On a far smaller scale, these Web pages hope to provide a similar function for Internet resources, by linking to the major subject gateways.

http://www.ilovelanguages.com/

iLoveLanguages is a comprehensive catalog of language-related Internet resources. The more than 2400 links at iLoveLanguages have been hand-reviewed to bring you the best language links the Web has to offer. Whether you're looking for online language lessons, translating dictionaries, native literature, translation services, software, language schools, or just a little information on a language you've heard about, iLoveLanguages probably has something to suit your needs

11.5 Web Catalogues/Subject Guides

http://bubl.ac.uk/link/linkbrowse.cfm?menuid=5885

BUBL LINK Catalogue of Internet Resources on language and linguistics. [United Kingdom] searchable and browsable libraries of networked knowledge covering all main subject areas.

http://library.leeds.ac.uk/info/200126/linguistics_and_phonetics/496/linguistics_and_phonetics_book

http://www2.lib.udel.edu/subj/ling/internet.htm

11.6 Wikipedia

Popular as wiki, this is a multilingual (45 languages), web based free content encyclopedia project. It is written collaboratively by volunteers from all over the world. One of the largest reference web sites since it was created in 2001.Provides links to guides on related pages with added importance. It has navigation, search, interaction and toolbox facilities.

http://en.wikipedia.org/wiki/Linguistics

11.7 Dictionaries

http://dsal.uchicago.edu/dictionaries/ Digital dictionaries of South Asia.

A collaborative effort to widen access to South Asian language dictionaries. Established dictionaries for over thirty modern literary languages of South Asia will be mounted on the Web for free and open access. Languages to be covered, in alphabetical order, are: Assamese, Baluchi, Bengali, Dhivehi, Dogri, English, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Maithili, Malayalam, Manipuri, Marathi, Mundari, Naga, Nepali, Newari, Oriya, Pali, Panjabi, Pashto, Persian, Prakrit, Rajasthani, Sanskrit, Sindhi, Sinhala, Tamil, Telugu, Torwali, and Urdu. Languages under consideration for a future project include: Ardhamagadhi, Avestan & Old Persian, Bodo, Brahui, Burmese, Dari, Khasi, Khowar, Kuki-Chin, Lahu, Lepcha, Pahlavi, Portuguese (in India), Romani, Santali, Tibetan, and Tulu.

11.8 FAQs (Frequently Asked Questions)

A major source of information for questions with answers as" Frequently Asked Questions" devoted to a specified topic in the area of linguistics and allied areas. Such sites build knowledge for a learner and add knowledge to specialists. Such FAQs are also found in the library site which guides a new user as to how to use the library fully.

http://www.linguistics.unimelb.edu.au/thieberger/RNLD/RNLDfaq.html Endangered Languages

http://www.essex.ac.uk/linguistics/LFG/FAQ/ Lexical Functional Grammar

http://lib.ex.ac.uk/screens/libfaq.html University of Exeter Library

http://www.faqs.org/faqs/ Online Education

11.9 Virtual Libraries

Internet resource directories, which are also called as "meta sources", "virtual libraries" and" resource guides", catalogue internet resources and provide hypertext links to these sites There are two types of resource directories- omnibus(e.g. yahoo and subject/resource specific. A virtual library facilitates access to many resources. It is basically a collection of subject guides on much area.

At CIIL library a virtual library in Linguistics has been created by B A.Sharada(2004) as an information service using the web resources and is available on the library homepage on internet site-http://www.ciil.org/main/virlib/index1.htm .A domain specific web site provides guidelines to linguist where to locate linguistics information in the digital environment.

12. DISCUSSION FORUMS AND USENET NEWS

Discussions forums, also called mailing lists, discussions lists and list servers, are the major network resource that serve the purpose of current awareness. They use e-mail to set up informal discussion among people of specific research interests via the internet. Forum software (Listserv) maintains a list of e-mail address of all subscribers/ members and the messages posted to the forum are distributed automatically to all the subscribers. Joining and leaving the forum and posting the messages are carried through mail. Participation in discussion forums has several advantages as the members are not bound by geographic distances. This prime fact helps the member to be up to date with current developments in field, often not found in the print media.

Unlike discussion forums, Usenet news is not delivered to the user's e-mail box. Instead , news reading software is used to access news from the nearest news feed computer News reading facility is supported by web browsers .Usenet news groups are hierarchically structured. An RSS and Atom file provides news updates in a simple form. Now RSS readers are common in every site.

12.1 Mailing List

http://www.ims.uni-stuttgart.de/info/MailingLists.html
http://members.terracom.net/~dorothea/elfling.html
http://www.baal.org.uk/amb_emaillinks.htm
http://www.linguistics.unimelb.edu.au/thieberger/RNLD/RNLDmailing.html

12.2 Usenet News

http://cognews.com/links Cognitive Science

12.3 Listserv

http://www.cognitivelinguistics.org/emcllistserv.shtml	cognitive linguistics
http://www.library.yale.edu/Internet/linguistics.html#listservs	educational linguistics

12.4 Newsgroups

News groups, discussion groups, list server are used almost in the same connation through these the user can choose to communicate with people or simply to observe other's communications.

12.5 Newsgroups and mailing list

http://www.cs.technion.ac.il/~gabr/resources/news_mail.html

13. ASK-A-LINGUIST SERVICE

The Ask a Linguist Web site is a service to which you can submit a question dealing with language or linguistics to a panel of linguists. It is provided by The Linguist List, an Internet network for professional linguists that includes faculty members from Oxford University, the University of Arizona, and the University of Michigan. While users can submit any type of question dealing with language they choose, a section of the site provides answers to frequently asked questions, with a particularly

thorough section devoted to Arabic. Previous questions are archived on the site, with message threads dating back to May 1997. Recent message threads on the Ask a Linguist Web site include "Origin of the Norwegian Language," "Is language innate?" and "Linguistics and literature." Equally helpful is the ability to search the entire message archive in a variety of fashions, including complex queries.

http://linguistlist.org/ask-ling/index.html Eastern Michigan University

http://www.abdn.ac.uk/langling/ University of Aberdeen on language and linguistics

13.1 Web Logs

Web log is a website that contains new articles or contributions in a primarily chronologically order, in which the most current one is on the top of the list. It is primarily a discussion-oriented instrument.

http://weblogs.ucalgary.ca/linguistics University of Calgary

http://blogs.botw.org/Science/Social_Sciences/Language_and_Linguistics/ Best of the web logs

http://www.abdn.ac.uk/langling/resources/funstuff.html

13.2 Podcasts

http://linguistics.arizona.edu/podcasts/index.php

University of Arizona Linguistics Lecture Slides Linguistics Lecture series presentation slides for the speakers who've elected to provide them are stored below. If you wish to view the presentation slides while listening to the podcasts, simply click on the link and the presentation will open in the Adobe Acrobat Reader.

http://languageinstitute.wisc.edu/content/uw_students/podcasts.htm

Language Institute -University of Wisconsin-Madison **UW-Madison Podcasts in Languages and Linguistics** .Click the links below to go to sites to listen or subscribe to podcasts in Dutch, English, French, German and Spanish! Many of the podcasts were produced with the assistance of staff from the College of Letters and Science Learning Support Services and with the Engage Program in the Division of Information Technology

13.3 RSS (Really Simple Syndication)

RSS allows people to subscribe to an online distribution of news, blogs, podcast etc.

http://www.colorado.edu/linguistics/ University of Colorado at Boulder.

Linguistics News and Events RSS CU linguist J. Andrew Cowell awarded CU Foundation grant for documentation of Arapaho Narratives

http://eng.sagepub.com/rss/

SAGE offers RSS feeds on all journal homepages on Sage Journals Online. The RSS feeds allow you to bring together the latest tables of contents for your favorite SAGE journals into your web page or RSS reader. There is no limit to how many SAGE journal tables of contents you can receive via RSS feeds.

13.4 Online Conference

http://www.uni-koblenz.de/~compling/Navigationshilfen/Library/

13.5 Online Journal

http://www.languageinindia.com Language in India

Language in India is a monthly online journal devoted to the study of the languages spoken in the Indian sub-continent

13.6 Scripts –India Online

http://www.cs.colostate.edu/%7Emalaiya/scripts.html Languages and Scripts of India

Large collection of varied sites on languages, linguistics, writing, and South Asian languages texts and manuscripts.

13.7 Social Networking Sites

Social networks are built upon a hypothesis that there exists a determinable networking structure of how people know each other. It helps to build a network among the interested group in discussing the common interest.

http://www.elpub.net/ Blog set up as part of conference 2008

About ELPUB 2008 Social Network

Welcome to the social networking site for ELPUB 2008. Use this network to find and connect with people at the conference. Location: Toronto, Canada June 25 - June 27 **Moderator:** Leslie Chan, Conference Chair.

The Linguist List - http://www.linguistlist.org/

Web site for the mailing list: professional communication and networking for the world-wide community of linguists.

14. PORTALS ON LANGUAGE AND LITERATURE

http://www.loc.gov/rr/international/asian/india/resources/india-language.html

These are the resources selected by the library of congress subject experts. This pathfinder includes information about language and literature in India created and maintained by the Asian Division.

14.1 The Academic Blog Portal In Linguistics

The academic blogs has been described as an academic blogosphere ,a kind of invisible college. The blogs are largely modifiable, so that users's can themselves add blogs and other forms of content that may be useful to academic bloggers and academic more generally.. However, before, modifying the contents, a user should consult FAQ's as well one has to create a personal ID account.

http://www.academicblogs.org/wiki/index.php/Main_Page Blogs in Linguistics and Philosophy.

Direct links to the blogs are on the left. Links to wikipages about these blogs (if someone has written them) are on the right.

- *A Walk in the Words* A Walk in the Words
- *Abecedaria* Abecedaria

15. CONCLUSION

Looking for a specific piece of information on the internet is quite like searching for a needle in a hay stack. With thousands of sites out there how do the professional know which site contains the information the user is looking for? In knowledge based society library 2.0 is a new paradigm which is user-centered change. It encourages constant and purposeful change, inviting user participation. The librarians and information professionals have adopted library 2.0 to recalibrate the process and the paradigms of the library and information services.

In this paper with the web resources and the library 2.0 model an attempt is made to give a glimpse of the developments that are taking place in the generation and dissemination of information in the

area of linguistics and languages. It is true that the internet a paradigm in global communication and information flow is collapsing all boundaries, bringing together the linguists community closer and closer.

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2] Linguistic Abstracts Online A search engine for published articles in linguistics. Requires either an institutional subscription or a subscription through LinguistList Plus http:// labs.blackwellpublishers.com

3] A group of independent linguists who specialize in language description and bible translation, contains many helpful resources and links, including Free International Phonetic Alphabet (IPA) fonts. http:/ /www.sil.org/

4] Noam Chomsky's Home Page http://mit.edu/linguistics/www/chomsky.home.html

Web Resources – Credibility and Evaluation: Role of Librarians

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"Web is the Great Equalizer" — Jakob Nielsen

1. INTRODUCTION

In recent times, the society is moving towards the direction of an Information Age where information has become very vital component for overall development. The technological advancement and changing trends have put forward new challenges before library and information professionals. The world in which we live today is digital world. In the 20th century, the world has experienced two revolutions viz. the industrial revolution and the information (technology) revolution due to evolutionary changes in the field of Information technology. Tremendous growth and diversification of knowledge have emerged with multidisciplinary subjects. Information has been identified as one of the vital resources needed for the success in almost every major human endeavor. Collection, organisation and dissemination of information system with economy and efficiency depend on the skills and expertise of the librarians. Information is needed in all aspects of society and in all disciplines. Users demand information i.e. timely, accurate, valuable, up to date and quickly available.

The role of library and information professionals has changed worldwide, no longer the keeper of books but the provider of information and learning opportunities. This means that *"a library is not a shrine for the worship of the books, but ought to be a maternity room of ideas, a workshop for creativity*". Library should always be the place to gain, discover and improve ones knowledge.

2. PARADIGM SHIFT

In the context of Change in the Libraries

Libraries	*Networks*
Custodian of Books Information Providers	Service oriented
Print	Digital
Ownership	Access
Order in Libraries	chaos on the web
One Medium	Multimedia
Media	Hypermedia
Copyright	copy left
Own Collection	Library without walls
Homogeneity (heterogeneity)	Diversity
In Good time	Just in Time

Libraries	*Networks*
Top Down System	Bottom down system
Real	Virtual
Tangible	Intangible
Intermediaries	End users
Monopoly	Equity
Library	Web
Intra-action	Interaction
In sourcing	Out sourcing
Open Source	WIKI source
Teaching	Learning
Local reach	Global reach
Books	Bytes
We go to the library	Library come to you
Book preserver	BIT preserver

3. INFORMATION SOURCES OVER THE WEB

The web has increased in complexity over the years and has gradually transformed from an online publication medium to a platform for carrying out complex tasks such as shopping, learning, communication and collaboration. The following sources are available over the web:

- Electronic Journals
- Electronic Discussion Lists/ Forums
- Usenet News
- Data and Software Archives
- E-mail based Information Services
- Campus Wide Information Systems
- Library Catalogues – Web OPACs
- Online Databases
- Guides to Information Sources
- Search Engines
- Subject Gateways
- Web Directories
- Oniine Chatting
- Commercial advertisings & Customer Service Information
- Organisations' Directories
- Bulletin Board Services
- Full text of documents

4. TYPES OF WEB RESOURCES

1. Open Web

Any thing online that can be found **freely** with a Search Engine

2. Gated Web

Online Resources accessible by **Subscription** E.g. OED, CA, LISA, BIOSIS, INSPEC, COMPENDIX etc.

3. Invisible Web

Databases that **are not found** by Search Engines and can only be accessible through a particular page or front end. E.g. LC's American Web Site http://memory.loc.org (Ramesh Babu, 2004)

MEANS OF ACCESS TO WEB RESOURCES

1. Through Search Engines
2. Through Web OPACs
3. Through Specified URLs/ Web sites

5. WEB SITE DESIGN

Web sites often provide the first impression of an organization. For many organisations, web sites are crucial to ensure sales or to procure services within. Websites can among other things gain strategic advantages for organisations such as facilitating institutional change, attracting prospective applicants, building community and sharing knowledge. (Lin, 2007). When a person opens a web site, the first impression is probably made in a few seconds and the user will either stay or move on to the next site on the basis of many factors. On the web usability plays a crucial role as user experience is emphasized and it is an inherent design characteristic and requirement and closely related to various user errors. Web sites design is an art of writing codes and creating web pages with using languages for e.g. HTML, XML etc. More specifically, they translate this theory into five principles of website design which determines the credibility of a website. It includes:

- building a dialogic loop between the organization and its audiences,
- providing useful information,
- generating return visits,
- making the interface intuitive and easy to use, and
- Eliminating unnecessary links and ads to retain visitors. (TM van der Geest, 2001)

There are seven main reasons users return to some websites and not to other websites. These criteria are the foundation of good web design which can be stated in an acronym "HOME-RUN" (Nielson, 2000) stands as

- **H**igh quality content
- **O**ften updated
- **M**inimal download time
- **E**ase of Use
- **R**elevant to User needs
- **U**nique to the online medium
- **N**et-centric corporate culture

5.1 Web Design Implications

Even though this topic is new and exploratory, but suggests various implications for design. In an effort to create credible Web sites, designers should keep the following in mind (Lazar, & Sears, 2005).

1. Visual design matters—invest here. No matter how good a site's content, the visual aspects of a Web site will have a significant impact on how people assess credibility. To create a highly credible Web site, one should invest in the design look of the site.

2. Accept that some elements are outside designer control. Some highly prominent elements are not within a designer's control. For example, someone besides an HCI designer may control the information accuracy or usefulness. Certainly a company's / Library's name recognition and reputation seem outside the scope of HCI.

3. Use research to influence stakeholders in the organization. Although important Web credibility elements go beyond the scope of HCI reading studies, one may positively influence people who control the site content or the company reputation.

4. Make careful decisions about prominence. The results suggest that important Web credibility elements are within designer control. HCI professionals should carefully consider what Web site elements to make prominent. Not everything can stand out at once, so finding the best elements to highlight on a Web site should be done with care. The perceived credibility of a Web site hinges on these decisions.

5. Ask users about credibility. Asking users to evaluate a Web site is not a new strategy for HCI professionals. However, making it standard practice to examine Web site credibility, even on a small scale, is new.

6. View other work on Web credibility with Prominence and Interpretation in mind. As more studies come forth on Web credibility, HCI professionals can better understand research results by seeing what the study is examining: Prominence or Interpretation or both. A clearer understanding of research findings on this area will lead to better applications of the results in one's own HCI projects.

5.2 Tips of Web Designers

- Design the websites to convey the real world aspect of the organization.
- Make the websites easy to use.
- The expertise should be given more importance.
- Avoid commercial elements to certain extent in the academic web sites.
- No scrolling of pages such as downwards and side wards are advised.
- Better to avoid dead links.
- Always provide relevant information to the site that should be easy to understand by a customer.
- It is essential to update the site regularly and better to specify the date of update.
- The site should be maintained regularly and check the dead links if any frequently.
- Navigation of the site should be consistent..

6. WEB SITES CREDIBILITY

Developing a website is one of the best tools to integrate and communicate all the library resources and services effectively to a wide range of users irrespective of the place and future trends. Engineering college library by developing homepage can disseminate a wide range of information to users it is best way to keep users abreast with latest developments of library resources and services with the introduction of pictures, graphics, 3D images, audio and video. A lovely homepage of library can be developed which will really help the users to have a complete knowledge of the library. Traditional models of library services are insufficient to meet current requirements of users. The increasing online environment resulting in users who are technology savvy, expecting more from the library. The engineering college libraries have to share their collections and shall have to offer new and more qualitative services to their users is the requirement of the day.

In the last few years, it is seen that a proliferation of Web sites with low-quality information, as well as sites that are outright misleading. Anecdotal evidence suggests that Web users are becoming more skeptical of the information they find online and may be vary of Web-based experiences. Along with the ability to exchange information relatively quickly brings the question of credibility. The credibility of the web sites, the quality of the information, and the validity of sources are some of the legitimate user concerns. As a result, those who offer Web sites, from corporate to individual operations now face increasing pressure to enhance the credibility of their sites. Because the web is relatively a medium for information and transactions, little quantitative research exists about what leads people to believe or not to believe the information one find online. Websites have become a preeminent communication channel because of their low-cost information dissemination capability, interactive capacity, and ability to reach different audiences.

The credibility of web sites is becoming an increasingly important area to understand. As a result, Web designers now face increasing pressure to enhance the credibility of their sites. But to this point, designing for Web credibility has been more art than science, leaving many Web designers to rely on intuition alone, without any support from quantitative research. Given the importance of Web credibility, it is remarkable that so few quantitative studies exist. Although some private companies have created proprietary knowledge about designing for maximum Web credibility, only a handful of studies in this area are public. In other words, little research has been published on why people believe information on some Web sites but not others.

6.1 WHAT IS CREDIBILITY?

Credibility can be defined as believability. Credible people are believable people. Credible information can be defined as believable information, information that can be relied upon as being accurate and correct. Trust, a closely related concept, can be defined as the belief that a person (or information) is reliable and dependable. Credibility is increasingly important with regard to web-based content because virtually anyone can publish information on the web. Web credibility is defined as perceived expertise and Trustworthiness of a web site (Fogg, 2002).

6.2 KEY ELEMENTS OF CREDIBILITY

Two key components of credibility such as—

- Trustworthiness
- Expertise

While evaluating credibility, one has to take an assessment of both trustworthiness and expertise to arrive at an overall credibility of the website. Trustworthiness, a key element in the credibility, can be defined by the terms *well intentioned, truthful, unbiased*, etc. The trustworthiness dimension of credibility captures the perceived goodness or morality of the source. Expertise, the other dimension of credibility, can be defined by terms such as *knowledgeable, experienced, competent*, etc. The expertise dimension of credibility captures the perceived knowledge and skill of the source.

6.3 Why Study Web Credibility?

- Many Web sites contain low-quality information.
- User experience is affected by the credibility of Web sites.
- Not all sources are equally valuable, and sometimes may not be authentic.
- User experience is affected by the credibility of the web sites.
- Research is still scarce.

What causes people to believe—or not believe—what they find on the Web?

- The success of most Web sites hinges on credibility.
- Those who create Web pages hope people will adopt specific behaviors, such as the following:
- register personal information
- purchase things online
- fill out surveys
- click on ads
- contribute content to a community
- download software
- bookmark the site and return often

If Web designers can influence people to perform these actions, they have been successful. When people believe the information on a Web site, the site is more likely to achieve its goal. However, Web site designers will probably fail to reach their goals if people doubt the information, or if they find the Web experience to be deceptive (lacking trustworthiness) or amateurish (lacking expertise). When a site lacks credibility, users are unlikely to remain on the site for long. They won't buy things, they won't register, and they won't return. They certainly won't think favorably of the organization that sponsors the site

6.4 Types of Credibility

There are four types of credibility:

1. Presumed Credibility
2. Reputed Credibility
3. Surface Credibility
4. Experienced Credibility

It's helpful to distinguish different types of credibility. But you won't find these distinctions in the psychology literature (Fogg & Tseng,1999).

- **Presumed credibility** judgments originate from assumptions made by the perceiver.
- The **Reputed credibility** assessments depend on source labels.

- The users make **Surface credibility** judgments based on layout or design of the website. It is the most reliable form of credibility.
- The **Experienced credibility** judgments are through the direct experience the user makes with a Web site

6.5 Key to Designing for Credibility

While designing the web site, the impact of the credibility is based on the prominence and the interpretation. There are *two* things happen when the users assess the credibility of the websites. They are: 1).The users notice something (prominence). 2)The user makes a judgment about it (interpretation). If one or the other does not happen, then there is no credibility assessment. The process of noticing prominent elements and interpreting usually happens more than once when a person evaluates a websites, with new aspects of the site being noticed and interpreted until the person reaches satisfaction with an overall credibility assessment or until the person reaches a constraint, such as running out of time.

6.6 Parameters for Web Credibility

- Ease of Use / Functionality
- Reliability
- Validity
- Amateurism
- Commercial Implications
- Characteristics
- Expertise
- Customer Satisfaction
- Other special information
- Facilities/Extra-Curricular related information

6.7 Guidelines for Web Credibility

- Design your site so it looks professional (or is appropriate for your purpose).
- Make it easy to verify the accuracy of the information on your site.
- Show that there's a real organization behind your site.
- Highlight the expertise in your organization and in the content and services you provide.
- Show that honest and trustworthy people stand behind your site.
- Make it easy to contact you.
- Make your site easy to use — and useful.
- Update your site's content often (at least show it's been reviewed recently).
- Use restraint with any promotional content (e. g., ads, offers).
- Avoid errors of all types, no matter how small they seem.

7. EVALUATION OF WEB RESOURCES

Different usability evaluation techniques have been developed and incorporated into the design and development of websites. Among these techniques, user testing and heuristic analysis are perhaps two of the most popular ones. Both user testing and heuristic evaluation methods provide valuable insight of usability problems in both 'finished-ready-to-launch-interface' as well as in 'iterative design-construction phase of an interface'. User testing relies mainly on the experience and comments of the users and is usually conducted in a scenario based environment. As a result, user testing would usually evaluate according to what exactly, rather than to what is possible. On the other hand, heuristic analysis relies mainly on the expertise and knowledge of human factors engineers that would evaluate the website based on a set of heuristics. Both these methods have their individual strengths and weaknesses and neither one guarantees an optimal result. The issue of whether these methods are complementary or competing has been the topic of considerable research. (Tan et al, 2008)

Need for the Evaluation of Web Resources

- Web resources are self-publishing medium
- Not all sources are equally valuable/reliable
- Sometimes, may not be authentic/accurate
- May not be current
- May not be filtered/mediated
- No standard in the publication

Analysing Information Sources

- Initial Appraisal
- Content Appraisal

Initial Appraisal

- Author
- Date of Publication
- Edition/Revision
- Publisher
- Title
- Contributors/Collaborators

Content Analysis

- Intended audience
- Objective reasoning
- Coverage
- Writing / Presentation Style
- Evaluative reviews

Category of Websites

- Advocacy websites
- ess/Marketing WebPages

- News WebPages
- Informational WebPages
- Personal WebPages

Evaluation Criteria

- Accuracy
- Authority
- Accessibility
- Arrangement
- Currency
- Coverage
- Completeness
- Objectivity
- Response time
- Stability
- Style
- Target Audience

Accuracy

- Is the information reliable and error-free?
- Are there editors and fact checkers?
- Currently no Web standards exist to ensure accuracy.
- Not fully developed
- Almost any one can publish on the Web
- Editors and / or fact checkers do not verify many Web resources

Authority

- Is it clearly stated, who is the author?
- What is author's position, qualifications, past writings etc?
- Is the Author associated with an organisation?
- What are the basic goals and objectives of the organisation?
- How reputable is the publisher?
- Who is the sponsor? Is reputable?
- Is there any contact address, phone, fax, e-mail address?
- Often difficult to determine authorship of Web Resources
- Publisher responsibility often not shown
- If author's name is listed, qualifications are frequently absent.

Accessibility

- How easy it is to get to the site?
- Can it be read by many kinds of software?

- Do they prefer a particular browser?
- How easy it is to use the site?
- Some of the e-journals are in PDF format that require Acrobat Reader.
- Mention to be made, if needed, about the name of the Software to access the page.

Arrangement

- Should be logical
- Easy to use
- Links/Buttons of the Web Page should be consistent
- Screens should be easy to be read

Currency

- Is the content of the work up-to-date?
- Is the publication date clearly indicated?
- Whether the Page is dated?
- When it is last updated?
- How current the links are?
- Whether any/some of the links expired? Or Moved?
- What is the frequency of updation?
- Are there any other indications that the material is kept current?
- Dates not always included on WebPages
- If included, a date may have various meanings, such as –
- Date first created
- Date placed on the Web
- Date last revised.

Coverage

- What topics are included in the work?
- To what depth are topics explored?
- What languages are covered?
- What time period is covered?
- Web coverage may differ from print or other media coverage.
- Often difficult to determine the extent of the Web coverage.

Completeness

- Information provided should be complete.

Objectivity

- Is the information presented with a minimum bias?
- To what extent is the information trying to sway the opinion of the audience?
- Web often function as a virtual Soapbox.
- Goals/aims of persons or groups presenting material often not clearly stated.

Response Time

- How much time it takes to load a Web Page?
- Depends on the client server's efficiency

Stability

- Is the site stable?
- Does the link address change frequently?
- If the address changes, whether the old page is left open with new link or address?

Style

- Are the sentences and directions clear?
- Is the grammar correct?
- Is it interactive, so that user can use buttons, forms and feedback instruments?

Target Audience

- In each and every source the targeted audience should be defined.
- Relevancy varies with purpose and user's needs

Additional Challenges presented by Web Resources

- Use of Hypertext links
- Use of Frames
- Search Engines can retrieve pages out of context or noise or overload of information
- Marketing oriented- Web Pages
- Blending of entertainment, information and advertising
- Software requirement may limit access
- Instability of Web Pages
- Susceptibility of Web Pages to alteration
- Quality of Web Pages linked to original Web Page may vary.

Web Page Evaluation Procedure

Step- 1: Identify the type of Page

Step- 2: Use appropriate checklist

Step- 3 Based on the checklist criteria, determine relative quality of page.

Web Evaluation techniques are only in the beginning and need to be developed further. Technology is outpacing the ability to create/develop standards and guidelines. Establishing evaluation procedures will be an ongoing evolutionary process. The growing popularity of web resources is increasing day by day which will help the user community to understand the design of the site and can evaluate the web resources in a better way. This will guide them to hunt for an authentic web site which will provide all relevant information regarding the quality of the information that has been hosted on the site.

8. ROLE OF LIBRARIANS

The role of librarian is that "*forget about the image of the librarian as mousy bookworm. Today's librarian is a high-tech information sleuth, a master of mining cool databases (well*

beyond Google) to unearth desired nuggets". He / she perform the following activities in the digital era:

- Getting acquainted with Web
- Know your electronic information resources
- Come closer to Local information networks
- Know your National & International Information Networks
- Know the Knowledge Databases
- Getting started with Internet information services, and
- Easy access to e-journals
- How to identify relevant databases in relation to a query?
- How to interconnect such databases?
- How to use different search strategies on the Internet like advanced search?
- How to build Web catalogues?
- How to serve as intermediary for Internet access to remote users?

9. CORE COMPETENCIES AND SKILLS REQUIREDFOR LIS PROFESSIONALS

- Technical Skills (ICT Skills),
- Management Skills
- Subject Skills,
- Information Skills
- Soft Skills

ICT Skills

- Operating systems
  - Dos
  - Windows
  - Windows NT
  - Unix
  - Linux
- DBMS/RDBMS
- CDS/ISIS/WINSIS
- Languages
  - PASCAL
  - C, C++
- Packages
  - MS Excel
  - MS Access
  - MS Word
  - MS Power point

- Knowledge of Library Automation Softwares
  - Web Awareness
  - HTML, XML
  - Front page
  - Web page design

Technical Skills

- Imaging technology
- Optical Character Recognition (OCR)
- Cataloguing and Metadata
- User Interface Design
- Knowledge of other online facilities/ services
- Internet Surfing
- Search Engines
- E-mail
- Proficiency with search techniques
- Web Directories
- Subject Gateways
- Electronic Bulletin Board
- Electronic Document Delivery services
- CD-ROM Searching
- Use of OPAC/ web OPAC

Management Skills

- General Managerial Skills
- Research & Project management skills
- Resource Management skills
- Systems Management skills
- Personnel & Financial management skills
- Funds raising skills
- Effective Leadership skills
- Marketing skills
- Customer relations skills

Information skills

- Collection management skills
- Information organisation skills
- Information retrieval skills
- Digital reference and information service skills
- Skills related to various types of user studies, user education etc
- Skills for providing value-added information products and services

Competencies are the skills, technical knowledge and personal attributes that enable individuals to contribute positively to their organizations and the library profession. These Core Competencies apply to all librarians.

- Demonstrates a strong commitment to excellent customer service.
- Recognizes and addresses the diverse nature of the library's patrons and community.
- Understands and supports the culture and context of the library and, if applicable, its parent institution.
- Demonstrates knowledge of the library system and the library profession.
- Understands the social, political, and economic context in which the library exists.
- Demonstrates knowledge of library and information science theory, information creation, organization, and delivery.
- Adheres to the Code of Ethics.
- Exhibits leadership skills including critical thinking, risk taking, and creativity, regardless of position within the management structure.
- Demonstrates commitment to working with others to achieve common goals.
- Acts within the organization to implement the principles of knowledge management.
- Exhibits an understanding of the importance of a multidisciplinary and cross-functional approach to programs and projects within the organization.
- Monitors and implements changes in technology and information systems.
- Shares knowledge and expertise with users and colleagues.
- Displays excellent communication skills and is able to promote the library and advocate for its needs.
- Communicates effectively with publishers and other information providers to advance the interests of the library.
- Recognizes the value of professional networking and actively participates in professional associations.
- Actively pursues personal and professional growth through continuing education. (Ramesh Babu, 2007).

10. ROLE OF LIS SCHOOLS

The library schools should assume the role of leadership and responsibility to produce competent manpower for the present as well as future needs of different kinds of information centers including University libraries. To conclude in the words of Lancaster,

"We must shift the focus of our professional concern away from the Library as an institution and towards the skilled professionals, who will become a professional practitioner on par with medical and legal practitioners"

11. CONCLUSION

Quality of Web resources varies tremendously. With the number of Web sites continually being developed, the issue of Web site credibility is growing in importance. Consumers need to analyze

information found on the Web to determine its reliability. In order to teach these skills, critical users need to be developed. Web credibility takes time to earn but can be lost with the smallest of errors. Create a credible site that speaks to visitor's needs and gives them a good user experience. Credibility won't come instantaneously and it showed by giving authenticated and reliable information. Engineering college librarians have to be serious in developing their own proficiency as well as must find out the ways to develop the professional competency in general to meet the exceptions of users.

Libraries today, even in their traditional form, are remaining an information resource which cannot be denied, and they are facing the challenge of more effectively managing and making available this resource. We must realize that there is still a lot to learn, that we can work smarter and that we can do more with less. There is no doubt that the availability of technology and digital media and the creation of the Virtual Library are going to have a profound effect on the future library and the IT professionals in our campuses, and it leaves us with an interesting prospect and challenge. This must be the best time to be an IT or library professional and it is up to us to make the most of it and contribute to the rapid changes taking place around us. In the future, Libraries will reinvent themselves by perfecting the path that they have now begun. They will become more of a fusion of physical and virtual realms. A large number of people may never even see foot in a library, but at the same time they will consume many of the resources and services made accessible to them in Cyberspace. In Knowledge economy era, libraries will carry out research on development and application of information resources, construction of virtual libraries, protection of intellectual property rights in the electronic era etc. thus founding the base for knowledge innovation. LIS Professionals in order to meet the challenges of the Knowledge economy are to build a Web Page for Libraries which demand an urgent attention.

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Web Resources and Services

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1. INRODUCTION

Technological advancement has its impact on education as well. The phenomena of globalisation and liberalization coupled with rapid technological changes have changed many aspects of human lives, including the way one learns. The challenge for teachers today is not only to impart skills but also to make the young learners fit for the dynamic society where the knowledge, culture, technology, attitude etc, are changing at an alarming rate. In the learning society of today need based education is of crucial importance. The system of education has to take the lead in the turbulently dynamic society where education is an instrument for social change. The learning society demands fast, flexible and need based education with application of Information Communication Technologies (ICTs). The IT revolution has already revolutionized the teaching / learning process. The inception of EDUSAT is a great leap forward in the teaching and learning activities of the civilized society.

With the increasing impact of information technology on higher education, all those concerned with higher education today are attempting to grasp how information technology could help in modernizing the processes of teaching, research and learning. And in this context, Internet has emerged as a formidable social and cultural institution of global proportions facilitating access to a wealth of information on the Web for the academic society to support their academic and research activities. The use of information technology helps and increases the research productivity of scholars.

Information technology applications and the techniques are being used by libraries for information processing, storage, communication, dissemination of information, automation, etc. Further, the origin of Internet and the development of World Wide Web revolutionized the information communication[3]. Recognizing the advantages of information technology applications in academic and research activities, governments are encouraging university and college libraries to provide information technology based library services to the user community.

The World Wide Web has rapidly become the most useful means of providing Internet resources combing hypertext and multimedia to provide a huge network of educational, governmental and commercial resources. The publishing industry is increasingly using WWW for publishing online resources. The electronic journal subscription by individuals as well as institutions rather than physical holdings is becoming order of the day. In the recent years, the use of Web sites has been widening, and the number of users accessing them is steadily increasing. Library and Information Centers provide access to databases and electronic journals via the online catalog and the Web to the end-users. The library websites of the institutes play an important role in promoting and maximizing access and use

of E-journals and databases. If a library's Web site acquires all the E-resources and links them with different options, it could be easily accessible by one and all.

Sri. Ramegowda, S., Ex-chairman of AICTE says in his lecture delivered at ISTE annual convocation that "A programme designed to help bring schools of the 21st century by interconnectivity by way of World Wide Web. They offer programmes such as putting a school on web, student home pages, teacher home pages, e-mail Network between teacher and parents and online yearbooks. This site can be of help for technical institutions to develop on similar lines".

2. NEED FOR WEB - SERVICES

1. Due to globalization of education, it is essential to bring Teachers and students together at the same time. It is possible through e-learning.
2. Educational Institutions wants enhancement in their competitiveness by training to manpower.
3. Teachers and students want to enhance their learning opportunities.
4. Widespread proliferation of Information Technology has enabled the Teachers and students to have access to Internet.

3. WEB RESOURCES

A web consists of numerous and diversified information resources around the world. This is the reason why the net holds the interest of the information professionals. Almost all the research and academic institutions are connected in one way or the other to the net. This helps the library professionals to offer net-based services. The major problem with the net is the staggering amount of data available and also inadequate retrieval tools on the net. To overcome these problems library professionals need to develop better skills and techniques to retrieve the required information to his/her organization to provide effective services and to make use of the web resources to the users.

Web resources become the format of choice for academic library patrons as they offer to-day's users many opportunities that were not available to predecessors. The advantages of web resources are:

1. International reach.
2. Speed of Communication.
3. Unlimited capabilities.
4. Reduced cost.
5. Convenience.
6. Searchability.
7. Linking.

Electronic books and journals offer a solution for some of the problems faced by the libraries today. They are space saving, enhance the speed of communication, provide powerful searching tools, immediate access to desktop and provide facilities such as integrated text, hypertext links and multimedia that the printed books and journals cannot offer.

The Teaching Web is a guide to the World Wide Web for all teachers. Ronald Owston has written an insight and comprehensive note on how to use the World Wide Web for teaching and learning. It is one of the best sites and the address is www.edu.yorku.ca/rowston/chapter.html.

E-lecturing: E-lecturing as learning environment provides crucial concept and techniques to fulfill learner's need so as to solve the problem through lecture/ discussion. E-lecturing uses learning management systems (Blackboard, WebCT, KEWL etc,) as a Web-based platform for distributing and facilitating the E-learning curricula. Learning management systems allow effective use of the Web for learning by:

a) Providing access to rich sources of information,

b) Encouraging meaningful interactions with content,

Bringing people together to challenge, support, or respond each other.

4. ROLE OF LIBRARIES IN WEB BASED - LEARNING

Library resources and services are indispensable to any academic institution as a primary knowledge resource for study, teaching and research. Library adopts new information systems and services with the emergence of new and better information technologies. In the changing scenario, the faculty and instructors have begun to adopt e-learning strategies as a part of their teaching programmes and the library has a positive role to play to collect, organize, and disseminate learning web resources to complement the teaching and learning process.

With the emergence of World Wide Web (WWW) in 1969, the world of teaching and learning has adopted it as one of its main innovations. However, in spite of extensive use of web in education, varieties of terminologies are used to depict this new field of knowledge. Some of the terms mostly used interchangeably are as follows:

4.1 Web-based Instruction

It is a "hypermedia based instructional programme which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported". (Khan, 1997).

4.2 Virtual Learning

"The educational process of learning over the Internet without having face-to-face contact is known as virtual learning" (French, Hale, Johnson and Farr, 1999). However, for some virtual learning may also include telelearning.

4.3 Online Learning

It is synonymous to web-based learning where learning is fostered via the WWW only, in an Intranet or Internet. Mishra (2001) calls it as the new generation in the evolutionary growth of open, flexible and distance learning.

4.4 E-Learning

"The term e-learning covers a wide set of applications and processes including computer-based learning, web-based learning, virtual classroom, and digital collaboration" (WR Hambrecht + Co, 2000, p8). However, the term e-learning is becoming widely accepted as a substitute for online learning and web-based learning.

The web today is used in three different ways by educational institutions:

1. Web integrated in the classroom teaching, that works as supplement to the face-to-face teaching;

2. Web used as a 'mixed mode' approach to complement face-to-face teaching, normally called 'blended e-learning'; and
3. Web used independently for teaching and learning as replacement for face-to-face teaching (Mitra, 1999; Berge, Collins and Dougherty, 2000; Bates, 2001).

The rapid spread of Internet and the World Wide Web (WWW) during the 1980's and 1990's has opened up new opportunities to make databases accessible via the web. Several advantages are seen for web-enabled databases:-

1. Global access to data that is in public domain, e.g.:-bibliographic, statistical, full text, image and multimedia databases;
2. Platform-independent access to data and information.
3. Dynamic updating of data ensuring that live data is available globally for use by decision makers, customers, vendors, etc. This is becoming particularly important in the rapidly growing e-commerce sectors.
4. The fact that a single interface, viz., Internet Browser is all that is needed on the client machine to access databases across the Internet, and
5. The possibility for developing and delivering interactive solutions and for the collection of valuable feedback, reactions, analyses, and user preferences for use in business and other decisions.

5. WEB - SERVICES

1. List of on-line Journals.
2. E-books list.
3. Maintaining the database of the important articles from different Magazines / Journals.
4. OPAC Online Public Access Cataloguing: - search for the books, journals and articles available in the Library.
5. Addresses of Reference Libraries: - Where one can find their pinpointed information / article.
6. List of websites which provides number of educational and other related active websites
7. News on Conference / Seminars.
8. CD's available in the library.
9. Library Security Deposit Rules.
10. Library News and Views:- Information about the library and views of its users about the library.
11. List of Online and Printed Journals: - subscribed by the library for the current year as well as back volumes.
12. Archive of the Photographs (Year wise): - available in the library. To know more about its alumni.
13. Recent Additions: - to the library. (New Arrivals).
14. Suggested Books / Journals: - by the faculty members / students / users of that particular library.

6. BENEFITS OF WEB RESOURCES

6.1 To the Students

1. Place to store history of development and growth.

2. Control over the information that is stored, displayed and accessed.
3. Can collaborate with anyone in the world.
4. As a tool to demonstrate their skills and competencies required by employers.
5. It can serve as a streamlined application by removing the need to fill out multiple applications or doing photocopies.
6. Developing the student's ability to reflect to their experiences.
7. Helps in planning more effectively for career development.
8. If a student want to transfer, the ePortfolio data my ease the process of articulation with another institute or university.
9. Even after completion of study having their work still available to them in a university-supported environment encourages in sustaining the relationship with their alma mater.

6.2 To the Faculty

1. Means of assessing students learning and preparing them for life long learning.
2. Tool to better manage, review, reflect and comment on student work.
3. Can use to build their own professional ePortfolios to document successful teaching and accomplishments for promotions and tenure reviews, grants, publications, consulting, and other professional development activities.
4. Means to share content with peers.
5. It helps in recalling student performance even after course completion. Say for example designing a letter of reference after some years.

6.3 To the Parents / Guardians

1. As a tool to remain updated about academic progress of their dear and near ones.

7. PROMOTIONS OF WEB RESOURCES

The libraries in the digital world move faster, rely on technology, and compete more intensely. The digital library initiatives enhance the services of the existing libraries and the promotional ways adopted for the E-resources service. In the library environment "Promotion" is the work of informing the end users the new services to secure the survival and prosperity. Promotion is an essential process for libraries and information centers because they:

1. Wish to achieve high level of customer satisfaction;
2. Want to enhance the perceived value of their services;
3. Would like to ensure the survival and prosperity of their respective institutions.

8. CONCLUSION

It has been established that Internet serves as an important tool in the world of information. However, to utilize the resources of Internet to its maximum, it is necessary to make the users (faculty and research scholars) well-versed in the surfing and browsing on the Net. Access to resources on the Net cannot be achieved unless and until short-term courses or workshops and training programmes

are conducted. This will help users to know various developments and searching techniques for accessing the desired information.

Information and Communication Technology based promotional services supplemented by the traditional best practices will enhance the activities of promoting web resources and services in the libraries. The library web pages are playing good role in promoting the web resources. If few more web interfaces are added in the library websites for enhanced functionalities, it will be encouraging to the end-users and so that the ultimate goal of investment on web resources could be achieved.

Since the Internet accessing has grown in popularity in the campus and everyone started accessing mail from the web based free mail providers, it was rationale to establish Institute's own mail server.

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Common and Current Challenges in Knowledge Management in Digital Information Society: A Proposed Solution for Organizational Adaptation

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Abstract: Knowledge management is emerging as a key concern of organizations, particularly those who have already redesigned their business processes and embedded a total quality approach into their practices. Knowledge management may mean management of knowledge, both explicit and tacit knowledge. Knowledge Management provides access to experience, knowledge and expertise that create new capabilities, enable superior performance, encourage innovation, and enhance customer value. Present paper attempt to highlights the growth and development of knowledge management in the changing context of digital environment as well as current and common challenges in knowledge management and its probable solution.

Keywords: Information, Knowledge, Knowledge Management, Digital Environment, Common Challenges, Knowledge Management Solutions

1. KNOWLEDGE MANAGEMENT : BACKGROUND AND MEANING

Knowledge management is an upcoming field of management, which focuses on maximizing business performance by making the most of the synergy between people, processes and technology. knowledge management is all about establishing the link between an organization' s obvious and implied intellectual property and positive business outcome. In practice, however, it involves an organization recognizing and mapping its intellectual assets, creating knowledge for competitive advantage, making large amounts of business information available, and allocating the best practices and technology that facilitates all of the above, including groupware and intranet. Knowledge management is not easy to define precisely or simply. It is a complex domain, like management itself. However, there are noteworthy connections between knowledge management and many popular management practices and strategies, including best practices, change management, benchmarking and risk of business process reengineering. Most recent business strategies accept and recognize that information and management, to mention a few. Largely, the business community also sees knowledge management as an accepted extension knowledge are its assets, and policies, strategies and tools are needed in order to manage those assets. The need to manage knowledge cannot be denied, but not many have acted upon that need. Wherever knowledge management is being implemented, it may stretch from technology-oriented methods of gaining access to, managing and delivering information, to substantial efforts at changing the organizational culture. Four steps in getting started in knowledge management are described by Boynton;

1. Making knowledge visible
2. Building knowledge intensity
3. Developing a knowledge culture
4. Building knowledge infrastructure

Secondly, Knowledge Management(KM) caters to the critical issues of organizational adaptation, survival and competence in face of increasingly discontinuous environmental change....essentially, it

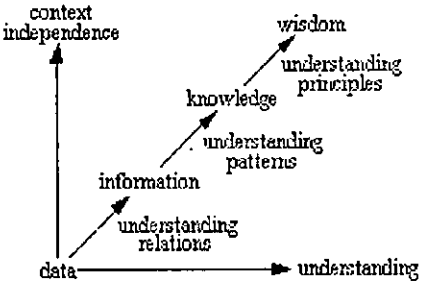
embodies organizational process that seek synergistic combination of data and information processing capacity of information processing capacity of information technologies, and the creative and innovative capacity of human beings

Thirdly, Knowledge Management promotes an integrated approach to identifying, capturing, retrieving, sharing, and evaluating an enterprises information assets. These information assets may include databases, documents, policies, procedures, as well as the un-captured tacit expertise and experience stored in individual's heads."

Fourthly, KM may simply be defined as doing what is needed to get the most out of knowledge resources. In general, Km Focuses on organizing and making available important knowledge. Km is also related to the concept of intellectual capital

2. UNDERSTANDING THE CONCEPT KNOWLEDGE

Data can be viewed as information- by utilizing new ways to channel raw data into meaningful information. That information, in turn, can then become the knowledge that leads to wisdom. Consider this observation made by Neil Fleming as a basis for thought relating to the following diagram.



- A collection of data is not information
- A collection of information is not knowledge.
- A collection of knowledge is not wisdom.
- A collection of wisdom is not truth.

The idea is that information, knowledge, and wisdom are more than simply collections. Rather, the whole represents more than the sum of its parts and has a synergy of its own. We begin with data, which is just a meaningless point in space and time, without reference to either space or time. It is like an event out of context, a letter out of context, a word out of context. The key concept here being "out of context." And, since it is out of context, it is without a meaningful relation to anything else.

3. KNOWLEDGE MANAGEMENT: GROWTH AND DEVELOPMENT

KM has emerged today as a multidisciplinary subject. As a discipline , it draws from a broad spectrum of disciplines and technologies such as follows:

1) Cognitive Science, which provides insight into learning and knowing that ultimately helps in improving the tool and technique for gathering and transferring knowledge

2) Artificial Intelligence and Expert Systems which help in automating the process of cognition
3) LIS which has a rich body of research and practice to contribute to KM
4) Organizational Science which explicitly deal with the need to manage knowledge
5) Technical Writing, which is concerned with effectives representation and transfer of knowledge
6) Decision Support system which provides insights to knowledge in the performance of cognitive tasks
7) Computer Supported Collaboration work(Groupware) which has immense potentialities for KM
8) Relational and Object Databases, which provide useful ideas to represent and manage knowledge resources
9) Simulation which is becoming a component of KM for learning and creation of knowledge
10) Other Technologies, which include hypertext, web technology, full text search and retrieval, performance support systems, object-oriented information modeling, help desk technology, electronic publishing technology, multimedia technology, etc.

4. WHY KNOWLEDGE MANAGEMENT IS NEEDED IN DIGITAL

Environment

- Service areas are increasingly competitive and the rate of innovation is rising.
- Reductions in staffing create a need to replace informal knowledge with formal methods.
- Competitive pressures reduce the size of the work force that holds valuable business knowledge.
- Early retirements and increasing mobility of the work force lead to loss of knowledge.
- Changes in strategic direction may result in the loss of knowledge in a specific area.(Ms. Macintosh's observations,2004)
- Most of our work is information based.
- Organizations compete on the basis of knowledge.
- Products and services are increasingly complex endowing them with a significant information component
- The amount of time available to experience and acquire knowledge has diminished.
- Competitive marketplace;
- Accelerating rate of innovations that need to be assimilated at an even faster rate.
- Increasing mobility among employees leading to loss of knowledge.
- Competitive pressure leading to reduction in the size of the workforce holding special and strategic knowledge.
- Majority of employees have less and less time to acquire knowledge. On the other hand, knowledge acquiring is a process needing and more time.
- Sometimes a company may take decision to change in strategic direction. It may result in loss of knowledge in a specific area. May be after a lapse of certain period, the company reverses its policy and feels the need of the lost knowledge, Meanwhile, it may happen that the employees with that knowledge have left the organization.

5. KNOWLEDGE MANAGEMENT : COMMON CHALLENGES IN AN ORGANIZATION

Most of the challenges in knowledge management primarily stem from the types of knowledge reuse situations and purposes. Knowledge workers may produce knowledge that they themselves reuse while working. However, each knowledge re-use situation is unique in terms of requirements and context. Whenever these differences between the knowledge re-use situations are ignored, the organization faces various challenges in implementing its knowledge management practices. Some of the common challenges resulting due to this and other factors are listed below.

1 *Data Accuracy:* Valuable raw data generated by a particular group within an organization may need to be validated before being transformed into normalized or consistent content.

2 *Data Interpretation:* Information derived by one group may need to be mapped to a standard context in order to be meaningful to someone else in the organization.

3 *Data Relevancy:* The quality and value of knowledge depend on relevance. Knowledge that lacks relevance simply adds complexity, cost, and risk to an organization without any compensating benefits. If the data does not support or truly answer the question being asked by the user, it requires the appropriate meta-data (data about data) to be held in the knowledge management solution .

4 *Ability of the data to support/deny hypotheses:* The organization could cleanse the system of very old files, thus diluting its own knowledge management initiative. Alternatively, it could set up another team to cleanse the database of redundant files, thus increasing its costs substantially. Apart from these, the real challenge for an organization could be to monitor various departments and ensure that they take responsibility for keeping their repositories clean of redundant files.

5 *Legitimacy:* In the print-only world, there has been a complex but well-defined system of content validation and description that involves librarians, referees, reviewers and publishers. After going through the various defined processes, its selection gave that material a legitimacy that students and scholars came to depend upon. Furthermore, technological advances and collaborative efforts have allowed the costs of this process to be reduced through shared electronic cataloging (e.g. OCLC) and through the purchase or licensing of abstracting and indexing electronic databases. Librarians recognized ages ago that the only scalable and affordable approach to such processes was to take advantage of leveraged and shared resources.

6 *Electronic Information Resources:* The rise of electronic information resources freely accessible through the Internet has disrupted this relatively efficient system in a number of ways. There is no clear and defined role for libraries with regard to the selection, preservation and provision of access in regard to the digital resources accessible through the net. Additionally, students and faculty have a need to learn how to evaluate these new information resources, and it is far more difficult to do so on the Web than it has been in a traditional library. With a traditional library, the very fact that a book or a journal was held by a library represented a conscious set of decisions about the validity of the information, and implied a filtering process that suggested a reasonable level of legitimacy. This is not true when one surfs the Web.

7 *Lack of Scalability:* Another problem is that of scale, as some libraries, academic departments, and even individual scholars are creating their own collections of Web sites, selecting and describing network resources they find useful and credible. In some cases these resources are even added to centralized databases, but the combination of the growth of the web, and the

lack of scalability of these individual, highly labour intensive approaches do not make such efforts a viable or affordable means of addressing this important challenge. There is some hope on the horizon in dealing with some of these issues, as there are some newly emerging, shared (and hence leveraged) cataloging resources such as OCLC's Cooperative Online Resource Catalogue (CORC) project, and the subject gateways being established by the ROADS project in the UK.

8 *Reality:* Currently, scholars trying to thoroughly research an area have to go to a library to do the traditional search process and then do an electronic search of the web and other electronic resources. This also implies that these people doing this searching have the ability to discern the quality, authenticity and validity of the information that they find on the web. Of greatest concern, is that a student might go just to the Web, either assuming that the information available there is complete and accurate, or assuming that the Web alone provides an adequate search. There is plenty of reason to believe that students today and in the future will fall into this trap, because their preferred method of working is to do everything online. While everything possible should be done to educate students and others that each of these two different approaches has its own respective merits, it is unrealistic to think that such educational efforts will be successful with the vast majority of students who have grown up with the Web.

9 *Search Engines:* Another problem with the Web today is the nature of the various search engines such as Yahoo! and Altavista. While such services offer far wider coverage than any traditional cataloging approach can possibly match, they do so with far less quality, filtering and a very different, often less powerful, level of description. A search using one of these engines may yield a half million or more hits. These search engines are also tainted by a bias in the selection process rooted in their commercial advertising relationships, rather than solely on the search parameters.

10 *Evaluation:* There is no clear and defined role for libraries with regard to the selection, preservation and provision of access in regards to the digital resources accessible through the net. Besides, Academic information seekers should have a need to learn how to evaluate these new information resources, and it is far more difficult to do so on the web than it has been in a traditional library.

11 *Use of information:* Most of the users do not use or know how to use their advanced features and the more sophisticated search algorithms embedded in these highly used applications. Consequently , they search virtually the entire web.

12 *Choice of Online:* A student might go just to the web, either assuming that the information available there is complete and accurate,or assuming that the web alone provides an adequate search. There is a plenty of reason to believe that users today and in the future will fall into trap, because they preferred method is everything they want to do through online

6. KNOWLEDGE MANAGEMENT SOLUTION IN DIGITAL INFORMATION SYSTEM

- **People Aspects**: Training development, recruitment motivation, retention, organization, job design, cultural change and encouraging thinking and participation
- **Process Aspects**: Process innovation, re-engineering both for radical and continuous improvement
- **Technology Aspects:** Information and decision support systems, knowledge-based systems and data mining systems.

- **Knowledge Management in an Academic Setting:** It must encompass the community of scholars in a given discipline and must be able to integrate publications, data sets, tools for manipulating such data, connections to databases of pictures and images and much more.
- **Systematic approaches to knowledge management:** It retain the traditional faith in rational analysis of the knowledge problem. the problem can be solved, but new thinking many kinds is required some basic assumptions:

a) A resource cannot be managed unless it is modeled, and many aspects of the organization's knowledge can be modeled as an explicit resource.

b) Solutions can be found in a variety of disciplines and technologies and traditional methods of analysis can be used to re-examine the nature of knowledge work and to solve the knowledge problem.

c) Cultural issues are important, but they too must be evaluated systematically. Employees may not have to be "Changed" but policies and work practices must certainly be changed and technology can be applied successfully to business knowledge problems themselves.

d) Knowledge management has an important management component, but it is not an activity or discipline that belongs exclusively to managers.

7. CONCLUSION

Knowledge has become important productive factor for the modern digital information system. The society will inevitably require intensified management of knowledge .How to manage knowledge will become an important subject facing libraries in near future. Knowledge Management in Libraries should be focused on effective research and development of knowledge, creation of knowledge bases, exchange and sharing of knowledge between library staffs including its users, training of library staff, speeding up explicit processing of the implicit knowledge and realizing of its sharing. Economic environment and information environment is changing quickly today. Since Knowledge management has become a powerful tool for promoting innovation and realizing reengineering the various walks of life, it occupies very outstanding position in the creation of the knowledge innovation systems of a country. Hence it is very essential to focus on Knowledge Management systems in Libraries by which the timely information service can be provided to the online user society.

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Competent Culture of Knowledge Management: A Rich Intellectual Resource

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Abstract: Globalization and information technology have drastically changed the functioning of the organizations. This change and dimension has influenced the strategic thinking that how knowledge should be managed effectively within the organizations. This paper briefly explains the knowledge (as a intellectual capital), its genesis and management in this globalized world. The article outlines the data, information, knowledge, cycle of knowledge creation, emergence of knowledge society, knowledge management perspectives, knowledge repositories, typical applications, key technologies required for implementing proper and effective knowledge management within an organization.

1. GLOBALIZATION

In the world where the ICT is spreading all over the world, the understanding the concept of globalization is becoming easier. In the globalization, the effect of change in trading and management conditions spreads up all over the world immediately from one place to another place weather it is related to regulations, finances, changes in the governments, economical changes, etc. with a correct accuracy. Taking decision by an organization of a nation effects the rest of the organizations of the world immediately as well as the decisions taken by the governments of various nations affects all the marketing and managing conditions in rest of the world. In the globalization, the mobility of the persons has increased for employment and lifestyle. The organizations are getting top brains of the world by offering higher 'packages' to them. Geographical boundaries are not much important in this world.

2. KNOWLEDGE ENVIRONMENT

The knowledge management is probably only the segment in the world on which a lot of attention is being given. In fact, knowledge is being recognized universally as the most important strategic asset that an organization has. Before understanding the knowledge that what actually is it?, It will be better to know how it generate? And is it same to data, information and wisdom? According to Russell Ackoff,[1] the content of the human mind can be classified into five categories:

1. Data: symbols
2. Information: data that are processed to be useful; provides answers to "who", "what", "where", and "when" questions
3. Knowledge: application of data and information; answer "how" questions
4. Understanding: appreciation of "why"
5. Wisdom: evaluated understanding.

Example: (1)

Cotton ---------→Yarn----------→ cloth----------→choice of the customers
(data)---------→(information)--------→(knowledge)------→(wisdom)

Fig. 1: Example converting from Data to Knowledge and Wisdom

Here is the example given above that cotton is data and yarn can be treated as information, when it converts in a cloth, it becomes knowledge, now buyer purchase it or not, it is totally his/her choice, i.e. wisdom.

It can not be said that always 'cloth' and 'choice' can be treated as knowledge and wisdom respectively. For example, if customers purchase any piece of cloth, it is a data for that person. The dress tailored by tailor is information. The dress put up in a show room, the customer purchases it or not it's his/her choice, is the wisdom.

Example (2)

As by Ler Alberthal[2] "Like water, the rising tide of data can be viewed as an abundant, important and vital resource with enough preparation, we should be able to tap into reservoir and ride the wave by utilizing new ways to channel raw data into meaningful information which in turn can become the knowledge that leads to wisdom.

The above categories (concepts), further can be explained diagrammatically as follows:

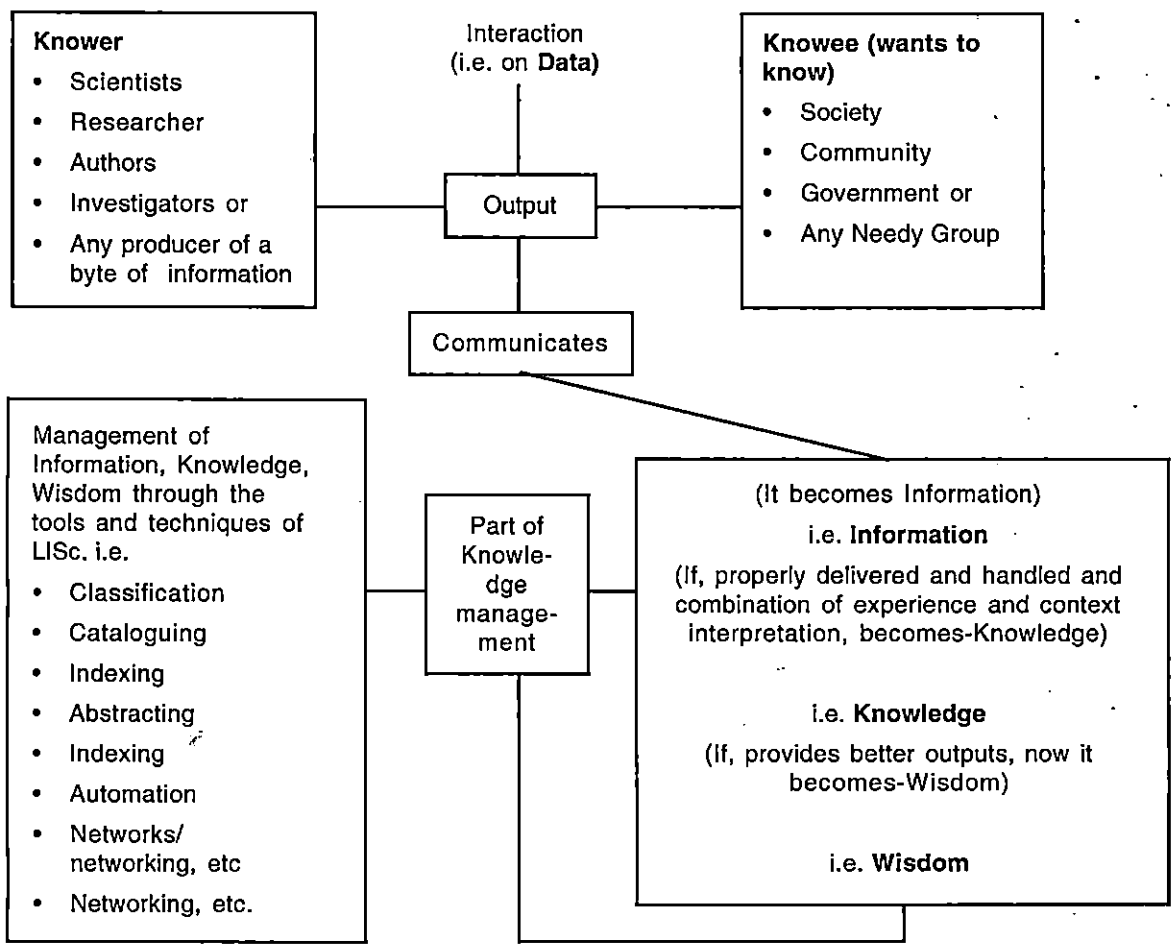


Fig. 2: Cycle for Knowledge Creation

Patten, beyond relations, has the capacity to represent knowledge. For the representation to be of any utility, it must be understood, and when understood the representation is information or knowledge.

Wisdom arises when one understands the foundational principles responsible for patterns representing knowledge. These principles are universal and completely context independent.

All the above mentioned explanation further can be represented diagrammatically as follows:

Consider this observation made by Neil Fleming [3] as a basis of thought relating to the following diagram: -

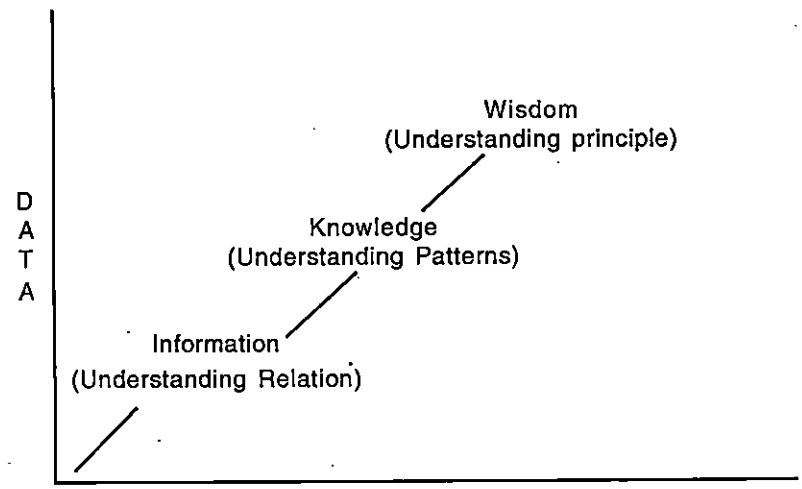


Fig. 3: Growth of Information

On the basis of the above diagram, the following can be concluded:

- Collection of data is not information;
- Collection of information is not knowledge;
- Collection of knowledge is not wisdom;
- Collection of wisdom is not truth.

3. INNOVATIVE EMERGENCE OF A KNOWLEDGE SOCIETY

The concept of knowledge society is as old as the civilization itself. Ever since the invention of fire and wheels as not looked back and set him firmly on the path of knowledge generation, accumulation, storage and utilization. Knowledge has given human beings a certain degree of sophistication, but their basic instincts (nature) remain untouched. It is a result of evolutionary process that transpires over a period of time. At present, the term "knowledge Society" has become a thrill word and such expressive use of the term gives an impression that it is a new phenomenon that not seems to be a truth. The knowledge has always has a function in the social life of human beings and most of the human actions are based on the knowledge. The power has frequently been based on advantages in knowledge and not on the physical strength alone. It has always been considered as power.

A Knowledge Society (KS) can be considered as a society in which the majority of it's members are engaged in knowledge generation, organization and utilization. It can be one where there is much knowledge and where many people do their work of knowing in a systematic manner. In KS members generally:

- Inquire into the basis of their belief about man, nature, society, etc.
- Are guided by objective standards with verifiable truth
- Follow scientific and logistic rules of evidence
- Dedicate considerable resources to their inquiries, and, thus, develop a large store of knowledge
- Employ knowledge to illuminate their values, goals, etc. as well as to enrich of the social mass.

In accordance with the Law of Change: -"Nature keeps everything throughout the universe in a constant state of Flux."

Nothing from the Electrons and the Protons of the matter to the Suns and the Planets which float throughout space is ever still for a single second.

Nature's Motto is keep Moving or Perish!

There is no halfway ground, no compromise, and no expectations for any reason whatsoever. This law finds its appreciable applicability in social dynamics where change acts as an essence and as a matter of paramount importance. The innovative and qualitative change leads to the development of Agrarian Society to Industrial Society and further leads to the emergence of Knowledge Society.

This could be depicted via Graphical Format: -

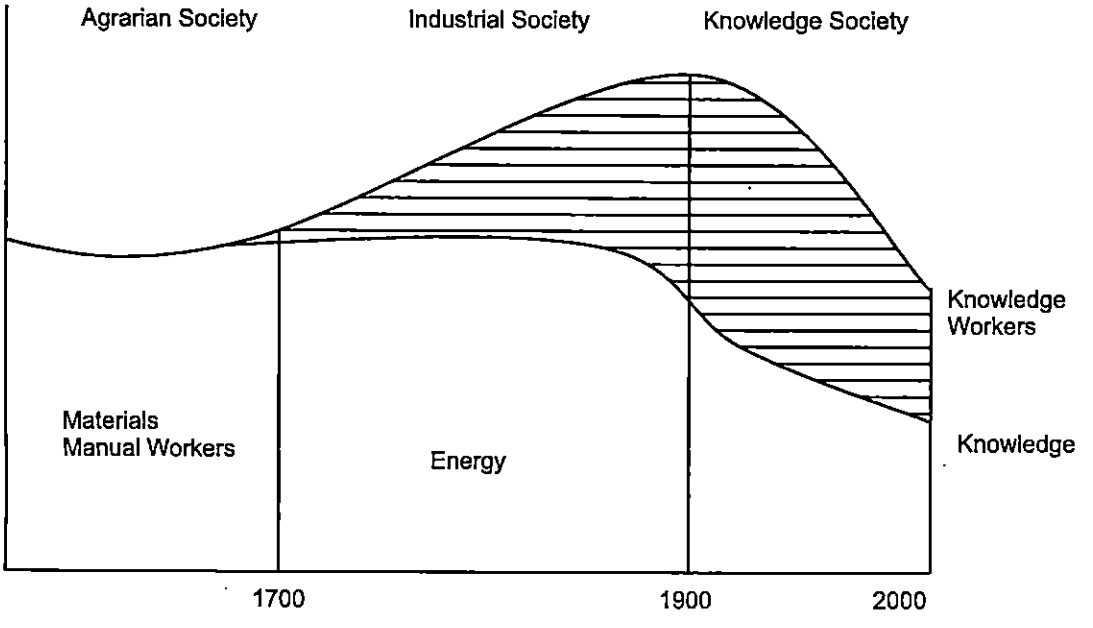


Fig. 4: Knowledge Society

In this age, efficient and prominent group of knowledge generators, knowledge workers, knowledge executives and knowledge entrepreneurs etc. are engaged in creating and evaluating the knowledge as a commodity and a valuable economics resource.

The building blocks of this society are IT, telecommunications, Financial Services, management Perspectives and Global networking etc. contemporarily, knowledge is a conventional resource and can be effectively and repeatedly utilized thereby holding an unusual point of benefit in this society.

This society has a lot to do for its dwellers, not only scientists or an information officer or a documentalist, etc. but a farmer can also act as a Knowledge Worker. For example a farmer could become a resource full person provided; he must be properly educated to improve the crop yield.

He can improve the pesticide coverage by adding a "Performance Maximiser" because it is an ADJUVENT when added to water, reduces the property of surface tension and makes the water "Wetter". It also helps water to penetrate the soil faster and more evenly. Here, the farmer is behaving as a knowledgeable person of the society.

Above example illustrates the substantial input of knowledge and emphasizes over it as an intangible asset.

During this global movement of knowledge, our country, a rich source of intellect must make a drive towards the establishment of a collaborative and co-operative culture.

4. KNOWLEDGE MANAGEMENT: AN EMERGING PERSPECTIVE

Knowledge Management (KM) is philosophy that needs interpretation of the activities within an organization. Under the label of KM, what companies generally does, is to manage the environment that optimizes knowledge. It is becoming apparent that the main constraint of KM is capacity – not in terms of people, but the actual knowledge of KM processes and techniques. In KM it becomes dilemma that how the results can be delivered and building capacity at the same time.

In KM, one must clear all the terms which are used in it as well the value of knowledge sharing for the effective KM. Before taking the initiatives, a knowledge manager must understand that what key knowledge does he has within the business that he can not afford to loss and what type of information do people need to have access to for effective decision making?

For the effective management of knowledge, it is essential for a knowledge manager to know about the resources available in the organization/centre viz. conference proceedings, reports and other feasible studies, etc. which are very-very important. And all those resources must be added with the virtual library and linked to the authors and experts who are involved in the creation of knowledge as well as to the real users of it.

The interpretation of KM, therefore, depends in the eye of the holder. The organizations interpret the KM as per their adaptability and philosophy. There is no universally accepted definition of the term. However, Marc Auckland defines the same as [4] " Knowledge management is a discipline that promotes an integrated approach to the creation, capture, organization, access and use of an enterprise's intellectual capital on customers, markets, products, services and internal processes."

With the advent of knowledge society in the current scenario of globalization, the wealth of a nation no longer depends on its ability to acquire and convert raw material but on the abilities and intellect of its citizens and the skills with which organization harness and develop those abilities.

Also, within an organization, the knowledge management is the deliberate and crucial element of the global business process by the virtue of its holistic approach. Knowledge initiatives are about achieving the next level in the continuous process of improving the business.

So, the core of the discussion is the desire to increase the organizational capacity and flexibility to develop an environment that provides the best chance of gaining competitive intelligence and strategic benchmarking.

According to Mike Devidson [5], the objectives of Knowledge management Programme includes four dimensions: -

- Mission : What we are trying to accomplish?
- Competition : How do we gain a competitive edge?

- Performance : How do we deliver the results?
- Change : How do we cope with changes?

To establish a connection of people with people, people with information, to promote the conversion of information into knowledge and to encourage the innovation and creativity via nurturing the knowledge environment.

It is believed that the conceptual value of KM lies in its environment as KM embraces the entire information transfer cycle from the creation, structuring, representation and linking information via disparate sources up to the ability to express, explores and exploit ideas. So, the focus has largely been on knowledge sharing behavior, a bit outside the LIS academic arena and the ability to manage and survive in less hierarchically structures organization.

5. FROM INFORMATION MANAGEMENT TO KNOWLEDGE MANAGEMENT

In the current situation, the imposition of traditional information processing model in the contemporary organization may lead to the suffering of management perspective. The new era requires continual reassessment of routines embedded in organization decision making process to ensure that underlying assumption are aligned with changing environment i.e. paradigm shift from Information management to Knowledge management.

Recent advances in IT have offered the means to organize various scattered pockets of information into organizational "Knowledge Repositories."

The functions of Knowledge Repositories (KR) may be stated as follows:

- These are the effective tools for managing and handling information and thereby maintaining the knowledge base of an organization.
- These involve the core concept of Inquiring Systems embedded in procedure manuals, mathematical models or programmed logic.
- These are helpful in reducing the duplication of information work.
- These basically motivate the process of information sharing and provide its immediate access to the employees of an organization at anytime, anywhere and in any format, and thereby derive maximum value from it.
- An organization possessing such repositories can expect its smooth functioning even after the departure of its employees.
- The KR basically supports mechanism to import export identity and retrieved digital assets.
- It serves as an indicator of organization's quality and helps in processing the institutions visibility, status and public values.

Tools & Techniques for implementing proper and effective KM within an organization:

- Information auditing.
- Knowledge mapping by knowledge practitioners.
- Facilitates provision of operational data, real time data etc.
- Documents and records management by maintaining Knowledge Base.
- Human resource development.
- Strategic planning and corporate governance.

- Establishment of a planning team whose objective is to study the benefits and strategy.
- Content management.
- Change management.
- Promote information and knowledge sharing by developing competencies.

6. CONCLUSION

The knowledge is formed and nurtured by people of the organization. In an organization, the managers of all the levels, stakeholders of all the varieties, etc. form the knowledge. As far as the people are concern as Knowledge Managers, it is not necessary that KM can be done successfully by the people from S&T background only, the people from the social science background also can equally manage it.

In the vogue context of KM, it is quite worthy to conceptualize, a literal quote of William Shakespeare:

"There is a tide in the affairs of men, which taken at the flood, leads to fortune: on such full sea, we're now afloat, And we must take the current when it serves, or loose our ventures."

The relevancy of this quote lies in the objectives of KM which ensures the optimization and encapsulation of intensive knowledge, managing the balance of people, processes and technology within timeframe, creating an environment for value generation in the organization and development of a corporate instinct so as to visualize the growing richness.

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Importance of Web Based Knowledge Management

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Abstract: Knowledge Management basically requires blending a companies internal and external information and turning it into actionable knowledge via a technology platform. Knowledge Management (KM) is the process of transforming information and intellectual asset into enduring value. Organizations purpose different Knowledge Management strategies to match their culture, priorities and capabilities. It is the primary source to stay in competition and also to sustain competitive advantage. The main advantage of web- based technology is it can be deployed in Internet or in intranet within the organization. Internet is also used to create a Virtual Private Network (VPN) using internet as medium of data transmission.

Keywords: Knowledge Management, Web technology, Knowledge Strategy

1. INTRODUCTION

Knowledge is Power; it is the totality of all existing information. Knowledge is a tool to achieve strategic objectives of any organization. S R Ranganathan defined, the Knowledge as" the totality of the ideas conserved by the humans." In this sense, knowledge is equal to universe of ideas. [1] Knowledge management (KM) is a discipline that promotes an integrated approach to identifying, managing and sharing all of an organizations information asset, regardless of how or where they are locked. Knowledge Management is strategic in nature and involves the careful interaction of people, process and Technology.

Knowledge acquisition involves complex cognitive process: perception, learning, communication, association and reasoning.

There is a broad range of thought on Knowledge Management with no unanimous definition. The approaches vary by author and school. KM may be viewed from each of the following perspectives: [2]

1.1 Tech no-centric

A focus on Technology, ideally those that enhance knowledge sharing.

1.2 Organizational

How does the organization need to be designed to facilitate knowledge processes?

Which organization work best with what processes?

1.3 Ecological

Seeing the interaction of people, Knowledge and environmental factors as a complex adaptive system.

Knowledge Management basically requires blending a companies internal and external information and turning it into actionable knowledge via a technology platform. Knowledge management involves capturing the knowledge generated by a firm-its best thinking on products, customers, computers and process and sharing it. [2]

2. CONCEPTS OF KNOWLEDGE MANAGEMENT

Knowledge Management is as a useful term to signal the more complex work involved in organizing access to networked information resources, and thus equates it with subject gateways.

Knowledge Management is the process of transforming information and intellectual asset into enduring value. It connects the people with the knowledge that they need to take action. In corporate sector managing knowledge is considered as a key to achieve break through competitive advantage. [3]

Knowledge Management is an excellent opportunity to elevate the library's position in the company and promote the staff's skills. It is often a daunting task.

3. TYPES OF KNOWLEDGE MANAGEMENT

These are two type of KM. i.e. Tacit Knowledge and Explicit Knowledge. [4]

Knowledge Management practitioners is Nonaka's reformulation of Polanyi's distinction between Tacit Knowledge and explicit Knowledge. [4]

3.1 Tacit Knowledge

Tacit sources of knowledge include individual employee's expertise, memories, values and beliefs.

3.2 Explicit Knowledge

When an individual combines discrete pieces, such as a finance manager collecting and synthesizing information and opinions from different parts of the financial report.

Subjective insights, institutions and hunches fall into this category. It is not visible nor management a challenge. [4]

4. OBJECTIVES OF KNOWLEDGE MAANAGEMENT

The important objective of Knowledge Management in libraries is to promote knowledge innovation.

(I) As bases for education, processing, storage and distribution of knowledge and information libraries represent an indispensable link in the knowledge innovation.

(II) Libraries take part in scientific research process directly.

(III) Libraries must pay attention to diffusion and conversion of knowledge.

They act as bridges for turning the results of knowledge innovation into realistic productive forces. Knowledge management in libraries is to promote relationship between libraries, between library and user. This help to strengthen knowledge, Internet working and to quicken knowledge flow. In the knowledge economy era, libraries will carry at researchers a development and application of information resources contraction of virtual libraries, protection of intellectual property rights in the electronic era etc. these finding the base for knowledge innovation. [5]

5. KNOWLEDGE MANAGEMENT PROCESS AND STRATEGY

5.1 Knowledge management Process

The purpose of knowledge construction is knowledge use. However, in making an individuals tacit knowledge explicit that knowledge needs to be organization as a whole.[6] Thus the focus of successful Knowledge management programme is to make this implicit knowledge about organizational knowledge explicit and to put in place systematic processes that identify it, develop it, share it and exploit it.[7]

5.2 Knowledge Centered Strategy

Organizations purpose different KM strategies to match their culture, priorities and capabilities. Fundamentally to derive the best business value for their existing knowledge based assets or try to crate new competitive knowledge related assets. To achieve this, enterprises tend to pursue one or several of the five basic knowledge centered strategies. [8]

5.2.a Knowledge Strategy as Business Strategy

Emphasizes knowledge creation, capture, renewal, sharing and use in all plans, operations and detailed activities to provide the best possible knowledge available at each point of action.

5.2.b Intellectual- Assets Management Strategy

Emphasizes enterprise level management of specific intellectual assets such as patents, technologies, customer relation etc.. Management task is to renew, organize, evaluate, protect and increase the availability and marketing of these assets.

5.2.c Personal Knowledge Strategy

Emphasizes personal responsibility for knowledge related investment, innovation, renewal, effective use and availability of others of knowledge assets within each employees area of accountability.

5.2.d Knowledge Creating Strategy

Emphasizes organizational learning, basic and applied research development and motivation of employees to innovate and capture lessons learned to obtain better and new knowledge, which will improve competitiveness.

5.2.e Knowledge Transfer Strategy

Emphasizes systematic approaches to transfer (i.e. obtain, organize, restructure or memories, repackage for development and distribute) knowledge to points of action, where it will be used to perform works. This strategy includes knowledge sharing and adopting best practices.[8]

6. KNOWLEDGE MANAGEMENT

6.1 What?

By the above discussion, it may be apparent that intellectual capital/knowledge is the most strategic asset for a company. It is the primary source to stay in competition and also to sustain competitive advantage. As such it needs to be managed. Knowledge management can be defined as "the art of creating value from organizations intangible assets."[9]

Macintosh [10] considers knowledge management to be crucial for the following reasons:

(i) Competitive marketplace.

(ii) Accelerating rate of innovations that need to be assimilated at an even faster rate.

(iii) Increasing mobility among employees leading to loss of knowledge.

(iv) Competitive pressures leading to reduction in the size of the workforce holding special and strategic knowledge.

(v) Majorities of the employees have less and less time to acquire knowledge. On the other hand, knowledge acquiring is a process needing more and more time.

(vi) Sometimes a company may take decision to change in strategic direction. It may result in the loss of knowledge in a specific area. May be, after a lapse of certain period, the company

reserves its policy and feels the need of the lost knowledge. Meanwhile, it may happen that the employees with that knowledge have left the organization.

(vii) The new trend has crept in basically because of the increase in information and importance related to this information. It is clear from the above statement that it is not only information that matters but other areas such as the available resources, technologies, skills and systems owned by an organization that also affect the progress of an organization. So, the complete known information related to all these assets, constitute knowledge management.

6.2 Why?

What is the benefit of implementing knowledge management programme in any organization? The answer to such questions requires through understanding of Knowledge Management and its expected return on investment (ROI). As eighty percent of organization knowledge is very different and it may not be possible also. The impact of a successful knowledge management programme can be seen in terms of new and better product developments. Higher customer satisfaction, reduce in input cost, higher productivity etc. These organizations have strong culture or sharing and innovating within their organizations.

7. WEB BASED KNOWLEDGE MANAGEMENT

With recent development in Internet technology and its wider acceptance and popularity there are many products available today to facilitate knowledge sharing and coloration using web technologies. The main advantage of web- based technology is it can be deployed in Internet or in intranet within the organization. Internet is also used to create a Virtual Private Network (VPN) using internet as medium of data transmission. We will discuss more about web based knowledge management system here. Organizations have used different platform to deploy a knowledge management system but in all most all cases a web browser is used as client end tool to access the knowledge management system.

7.1 Advantage of Web based Knowledge management System

This is easy to maintain as development requirements which are limited to the server side. Changes can be done to the system easily and continues improvement can be done to the system.

7.2 Requirement of a Web based Knowledge Management

7.2.a Web Server

There are many web servers available in the market today and Microsoft server is a major player in the corporate market today. Window 2003 server is the most recent one. In the other hand the Linux server is of great demand as a part of open source community. Window server usually runs IIS (Internet Information Server) as the web server and in the same way Linux server runs APACHE as the web server.

7.2.b Network

An existing network can be used to develop web based knowledge Management.

7.2.c Knowledge Management Portal

KM portals are developed with database support to keep the records of authors, members, access levels, visitor tracking and many other requirements. Usually all contributions of members' passes through a veteran approval system before it goes to the public view or the member view.

7.2.d Web Based Discussion Board or Forum

This is an ideal solution for branch offices, communities located in different geographical areas but having common area of interest. They can share there common problems, areas of concerns, experience and help each other in building a strong bond of networking.

7.2.e Blogs

Web blogs are popular now days and companies have utilized this tool to create awareness and evolve opinions on different issues. Blogs can be hosted in the company intarnet or popular blog sites like blogspot.com can be used to give a platform to the employees to post their views. Many companies have their blogging policy also.

7.2.f Expert System

Experts database with profile updating can be kept for the public view and queries can be posted to specific experts based on the areas of domain and expertise of the exports.

8. CONCLUSION

Knowledge management has become a powerful tool for promoting innovation and realizing the various walks of life. The value of knowledge management relates directly to the effectiveness of an organization to deal with today's competitive situation and create their future.

Knowledge management process involves certain steps such as identifying, collecting, selecting, organizing storing, sharing, applying and creating. Extraction of tacit knowledge is a challenging area of knowledge management.

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Knowledge Management Development: A Strategy Approach

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Abstract: The article traces the importance of Knowledge Management, the strategies involved in setting the KM in an Organization, the various components associated in formulating strategies including processing, knowledge assets, steps involved in developing KM The study identify the various activities of KM, the competencies and the available technologies to support the task in the Organization. The Knowledge Chain Model offer the helping hand to the KM services in an Organization to benefit for its faster growth evolving competitive strategies by incorporating K-Audit at regular intervals.

1. INTRODUCTION

Present era witnessed the Global Competition pressuring the Organizations to produce products and services in the shortest possible lead times with high quality at lowest cost. The various phases of lifecycle of the product would involve the product and progress information generation and further utilization. Such lifecycles include requirement definition, conceptualization of the design, production, operation maintenance, quality assurances etc and each one of these stages are the consumer as well as producers of information. Such consumed and used information of these different phases generates new information during the process. Knowledge Management (KM) of a product and services consists of the product information related to design, specifications, aesthetic information, definition etc.

It should be noticed that modern day consumer requirements are complex and vary from individual to individual and the development of such requirements become more collaborative amongst the teams involved in producing the products and services and it is evident from the present day service industries depending heavily on the filtered and ready to use knowledge for their products and services. Holsapple and Singh in their study underlined the value of knowledge and knowledge resources. The study mentions that the best use of the knowledge resources of the industries and their interest of enhancing their productivity, agility, reputation and innovation. A key question is that every knowledge based organizations concerned with how to approach the task of forming KM strategy.

2. KM STRATEGY FORMATION

Knowledge Management strategy of any Organization is to track the available knowledge, refine and use for the maximum benefit of the Organization to stay on front line to compete and sustain in the present era of Globalization and Liberalization.

The notion of a strategy has varied meanings and here, strategy as being a systematic plan of action for deliberately using an organization's resources in ways that fulfill its purpose. A knowledge management strategy, then, is a plan for marshaling and applying knowledge-oriented resources in the interest of sup-porting the organization's purpose.

3. Knowledge Processing

An organization's knowledge processing capabilities can be categorized into those that are technologically based and those that are practice based. Capabilities can depend on a combination of these two. Knowledge processing capabilities manifest in the ac-tual activities that an organization

performs as it oper-ates on its knowledge assets. KM strategy determines what technologies and practices will be adopted in any given instance of a KM activity.

Information Technology (IT) is being subsumed by *'knowledge technology.* IT systems for automated trans-action handling, record storage, and reporting remain important. However, the emphasis going forward is on technological systems that support knowledge amplifi-cation within and across organizations. This knowledge technology involves the use of computer and communication technologies to automatically acquire, derive or discover knowledge needed by decision makers in given time. Knowledge technology foster knowledge sharing and unleashes the creative potential inherent in knowledge-worker col-laboration. It includes technology that measures and coordinates the activities of knowledge workers. Knowl-edge technology provides a basis for organizational memory and learning. It also involves technology to personalize timing and presentation of knowledge de-livery according to knowledge-worker profiles.

4. KNOWLEDGE ASSETS

An organization to begin developing a KM strategy is to ascertain the competitiveness of its present knowledge position. Zack suggests that com-petitive knowledge position can be categorized in terms of the degree of innovation relative to its competitors within an industry:

4.1. Core Knowledge

The basic body of knowledge required of all players in an industry in order to remain competitive.

4.2. Advanced Knowledge

Knowledge that distin-guishes an organization from other players in its industry in a degree sufficient for achieving a competitive edge.

4.3. Innovative Knowledge

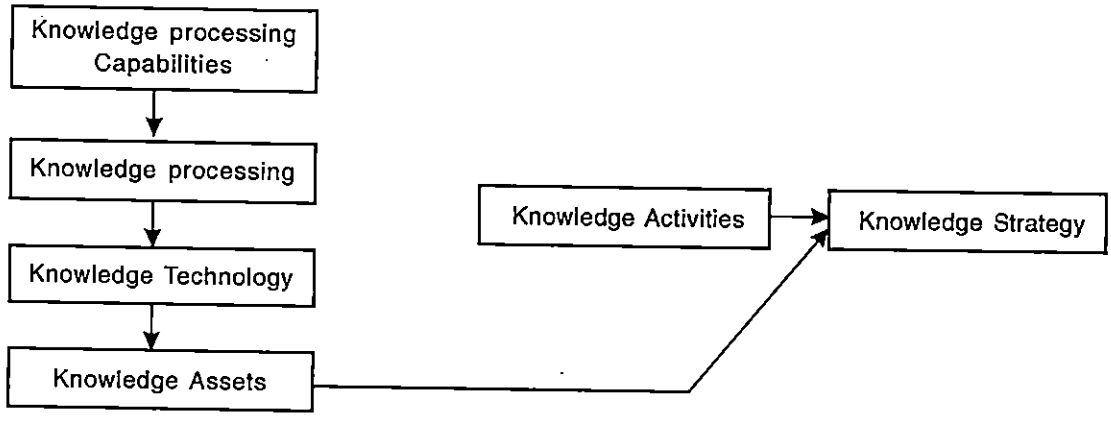
Knowledge held/applied by an organization that is so distinctive that it is the basis for being a market leader in the industry.

By evaluating its knowledge assets relative to these three categories, an organization's competitive knowl-edge position becomes evident. Zack advo-cate using a strength-weakness-opportunity-threat (SWOT) analysis to recognize deficiencies in an organization's knowledge position, as well as knowl-edge strengths that can be leveraged

5. DEVELOPING KM STRATEGY

An organization should recognize that its KM strategy can be connected not only to its knowledge assets, but also to its knowledge processing capabilities. In addition to guiding KM strategy forma-tion through an analysis of an organization's actual and potential knowledge assets, there needs to be an analy-sis of possible practices and technologies that may be adopted for operating on those assets. This analysis of knowledge processing capabilities may follow the for-mat used for knowledge assets. The capabilities can be classified into core, advanced, and innovative catego-ries to understand the organization's knowledge pro-cessing capabilities relative to those of competitors. Further, via a SWOT approach, an organization needs to ascertain whether to increase knowledge processing capabilities in a particular area such as assimilating knowledge, whether opportunities to more fully exploit existing knowledge processing capabilities, whether new practices/technologies can be developed in-house, or whether the practices/technologies can be implemented via outsourcing, alliances, and or acquisition.

Knowledge Management Strategy Formation: Aspects of knowledge management strategy



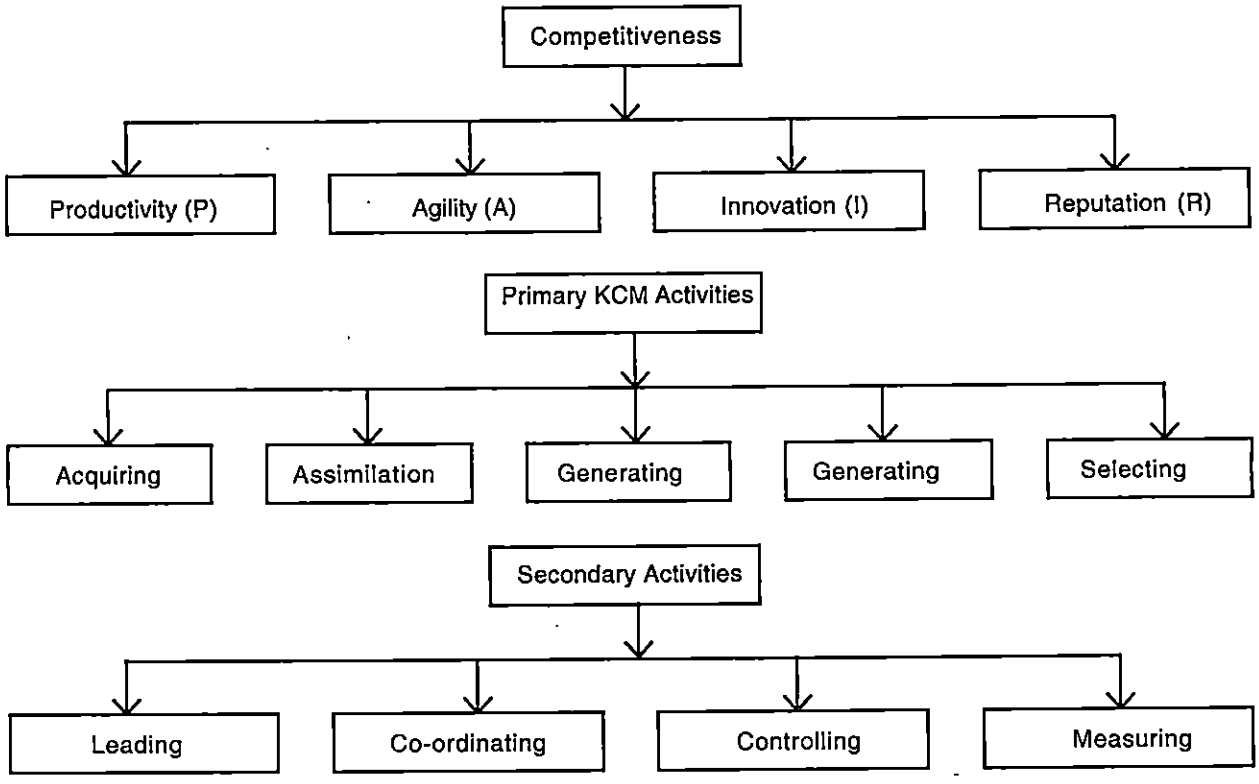
By formulating a strategy to perform one or more of the value activities better than competitors, the organi-zation can attain a competitive advantage. Analogously, it would be helpful for KM strategists to have a model that identifies basic kinds of KM activities that can be focal points for competitiveness. By formulating a plan in-volving practices and or technologies to perform one or more of these KM activities better than competitors, the organization can attain a competitive advantage. The Knowledge Chain Model identifies these activities, thereby offering guidance to those who formulate KM strategy.

6. KM CHAIN MODEL

Knowledge Chain Model (KCM) is derived from a collaboratively engineered ontology of knowledge management. The KCM is supported by empirical studies that show a connection between each of its KM activities and organizational competitiveness. It is important to understand that the KCM is not a process model. It identifies activities of particular in-terest to persons formulating strategy. Instances of the activities occur simultaneously, serially, in parallel, and in loops combining to form various patterns in the course of organizational operations.

Rockart and Short, underlined in their study that, several researchers have proposed models derived from the Value Chain Model to help understand various aspects of IT. One of these, called the Information or Knowledge Value Chain, adapts the value chain to propose a linear process model that describes stages in an organization's pro-cessing of information and knowledge. The study use this model as a basis for devel-oping a framework that can be used to evaluate KM efforts in terms of cognitive, post-cognitive, behav-ioral, learning, and organizational impact assessments. King and Ko, briefly suggest another use of the model, namely, that planners sequentially consider each stage in the Information/Knowledge Value Chain to design strategic systems. This consideration can involve brainstorming or other approaches to stimulat-ing ideas about the stage, with the aim of uncovering better ways to implement it. Brainstorming and similar approaches can also be applied to any of the Knowledge Chain Model activities.

The original Knowledge Chain Model: Knowledge Management Strategy Formation



The Knowledge Chain Model includes five primary activities that an organization's knowledge processors perform in manipulating knowledge assets. These five activities are identified in the KM ontology as the five generic KM activities involved within knowledge man-agement episodes. They are acquiring, selecting, generating, as-similating, and emitting knowledge. In addition, the KCM includes four secondary activities that support and guide performance of the primary activities. These four KM activities are identified in the KM ontology as managerial influences on the conduct of knowledge management: leading, coordinating, controlling, and measuring knowledge management initiatives. The KMC recognizes four ways in which improvements in the design and execution of KM activities can aid competi-tiveness, better productivity, greater agility, greater innovation, and enhanced reputation (PAIR).

KM skills of an organization's participants need to be trained and cultivated in the process of performing the activities. When a specific instance of a KM activity occurs in an organization, it is performed by one or more knowledge processors, some human and other computer based. Multiple processors may be able to perform a given type of KM activity.

Knowledge acquisition refers to the activity of iden-tifying knowledge in the organization's external envi-ronment and transforming it into a representation that can be assimilated, and or used for knowledge generation or emission. Selecting knowledge refers to the activity of identifying needed knowledge within an organization's existing knowledge resources and pro-viding it in an appropriate representation to an activity that needs it. Generation is an activity that produces knowledge by discovering it or deriving it from existing knowledge, where the latter has resulted from acquisition, selection, and/or prior generation. Derivation involves the use of process knowledge and descriptive knowledge i.e data, information, to generate new process and or descrip-tive knowledge employing

KM skills that are of an analytical, logical, and constructive nature. Although the result is "new" to the processor that derives it, it may have previously existed but not have been assimilated, or it may already exist elsewhere in the organization but not be subject to facile selection. Discovery generates knowledge in less structured ways, via skills involving creativity, imagination, and synthesis.

Assimilating is an activity that alters an organization's knowledge resources based on acquired, selected and generated knowledge. It receives knowledge flows from these activities and produces knowledge flows that im-pact the organization's state of knowledge. Emitting knowledge is an activity that uses existing knowledge to produce organizational outputs for release into the en-vironment. It yields projections like embodiments of knowledge in outward forms, for external consumption, in contrast to assimilation which may also yield projec-tions, but which are retained as knowledge assets. Emis-sion is only partially a KM activity because it also can involve physical activities such as production through raw material transformation.

Using the Knowledge Chain Model in KM Strategy Formation

Formulating a KM strategy is not a trivial task. Moreover, it needs to be developed in concert with other aspects of an organization's overall strategy like marketing strategy, financial strategy etc. This develop-ment could be after fact, devised to be aligned with and supportive of pre-existing business strategy. Alter-natively, KM strategy formulation may be an integral part of an organization's overall strategy development. KM strategy is concerned with design and deployment of suitable mix of practices and tech-nologies for performing the knowledge management activities that can contribute to organizational perfor-mance and competitiveness.

KM Activities

Following are the basic activities of the KM of an Organization

Understanding Business, Goals & activities - to define KM objectives.

- Knowledge Mapping
- Understanding People, Processes: to know business, processes also finding K-gaps or overlaps at all at primary level.
- Defining Questionnaire for capturing details about what is Knowledge?, What are the K-needs, K-Flow, K-Inventory of Existing Knowledge
- Conducting K-Audit
- Identification of overall Knowledge gaps & overlaps
- Knowledge Strategy formulation

KM Competencies

- Knowledge audit assessment and mapping
- Metadata and Taxonomies
- KM strategy formulation and implementation roadmap (for clients)
- Yellow pages of Experts
- Identification and management
- Collaboration across business units, cultures and geographies to achieve common goals
- Special interest groups, discussion forums and social networks
- Portal, Document Management, Search and Collaboration technologies.

- Wikis and Blogs
- Reusable components
- Shared workspaces
- Best practice management
- KM metrics, measurement and reporting through dashboards
- KM culture

KM Technologies/Software

The following are some of the Proprietary technologies identified for KM activities

- eGain Knowledge Agent™
- SmartHelpDesk™
- AskMe Enterprise,
- ARES Provides the Competitive Edge for Your Business Needs
- KnowledgeStorm Inc
- KNOVA® Version 7.2 Named Trend-Setting Product of the Year by KMWorld

The KM activities identified by the KCM are not the only determining factors that can lead to competitive-ness. There are other forces that influence how the conduct of KM ultimately unfolds in an organization resource influences the knowledge assets and envi-ronmental influences. This suggests that the KCM could be extended to include resource and environmental factors, which both constrain and enable the execution of KM activities. The future research direction is to investigate this extension.

7. CONCLUSION

In the interest of being competitive, a knowledge-based organization must adopt, design, and implement knowl-edge management activities better than other organiza-tions. The Knowledge Chain Model identifies nine classes of KM activities and over many specific KM activities that appear to be common across diverse organizations. The KCM holds that individually, and in combination, these KM activities can be contributors to competitiveness. Thus, KM can yield a competitive advantage to the Organization over the others; the Knowledge Chain Model provides structure to design-ers of KM strategy, ensuring full consideration of the varied KM activities that can be sources of competitive-ness in the directions of better productivity, agility, innovation, and reputation of an Organization at large.

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Knowledge Management in Corporate Environment

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Abstract: As a management philosophy and practice, KM's future will be determined by its effect in the workplace. In this paper the quest is capturing a framework for establishing KM strategies. The paper makes an overview of importance of KM and innovation in the scenario of economic fluctuation & challenge followed by study of the pitfalls and problems in capturing, consolidation and maintaining distinctive knowledge. Thereafter a quick survey is made on creation useful concepts and issues that have bearing on KM and professional intellect. Discussion is concluded with a suggestive framework for establishing strategies for KM and selection of KM category.

Keywords: Knowledge Management, Corporate Environment

1. INTRODUCTION

Knowledge Management (KM) is a Management Practice that uses an organization's intellectual capital to enable the enterprise to achieve its organizational mission. In those enterprises and organization in which a decision has been made to invoke KM as the organization's management philosophy (or as an essential component of the organization's overall management methodology), the corporate culture is one that recognizes that the organization's primary asset is the knowledge of its people.

The accepted operational attributes associated with KM are innovation, collaboration, and Knowledge development/knowledge sharing. These attributes are the consequence of an enterprise or organizational framework that is built on:

- Excellence in information management, including the development and implementation of a sophisticated system for identifying, capturing and organizing essential information, and the infrastructure to support this system;
- Excellence in strategic (performance - centered) learning and attention to the convergence of organizational learning and enterprise management; and
- Attention to the establishment of the organization's social communities through the creation of a social infrastructure built on a foundation of trust and concentration on relationship building.

Intellectual capital is the knowledge that comes from the developed and accumulated experience, Service, and products of the organization's employees, at all employment levels. This knowledge can be explicit (that is, captured in a format which can be manually or electronically documented and/or manipulated, as required), tacit (that is, not captured or recorded, but available through the social interactions of those who have it and those who need to access it), or both. When an organization establishes and commits to KM as its Management methodology, the organization can be said to be using its collective intellect to accomplish its strategic objectives.

The purpose of KM, as a management practice, is to establish, maintain, and sustain an organizational environment in which employees achieve their highest levels of productivity, resulting in the successful achievement of the organizational mission. There are, of course, two kind of knowledge required in the workplace. For knowledge workers (defined as employees who produce, organize, or use information in their work), the classic goal is to "know what", that is, to add to their body of knowledge so that they can work more successfully. The term cam also can be used (but often is

not) in the context of what is sometimes referred to as "know-how " In this context, workers who might not necessarily be "knowledge worker" as defined here learn praon each other, or from more experienced coworkers, as has been evidenced through the age in apprenticeships, crafts guilds, and similar arrangement in which "know-how" is passed on (as with factory workers, say) from one employee to another.

In all cases, the goal of KM is to improve the quality, efficiency, and consistency of the work that those employees perform, and the objective is to enable the organization to apply the same standards of asset management to explicit and tacit knowledge as to other organizational assets.

2. ISSUES RELATED TO DISCRIPTORS, INTERPRETATIONS AND CONTEXT

From its inception, the acceptance of KM as a viable and legitimate management methodology has been characterized by variation in its definitions, and by the usual tension that accompanies any new (or newly restored) management technique. For example, once the subject of KM comes up, particularly among academics or those in the management community who are inclined to think along "academic" lines, the discussion soon turns to identifying and debating the differences between information and knowledge. Inevitably, the discussion leads to someone's saying something like, "knowledge cannot be managed, only Information can be managed", which is, of course true. Nevertheless, the concept of managing knowledge, within an organization framework in order to support organizational success, is attractive. Certainly of term "knowledge management provides workable and useful (if some what inaccurate) shorthand for those with management responsibility, as they attempt to identify and utilize management techniques and seek an appropriate management philosophy for accomplishing the organizational mission. These acceptances are recognized by those who are involved in the KM effort, as noted by Laurence Prusak. When an interviewer commented to Prusak that he and Tom Davenport (who with Prusak is considered one of the first to recognize the importance of KM to the management community) are known to have wished they could "take back "the turn "knowledge management, "Prusak replied, not surprisingly," yes, It is really working with knowledge. You can't manage knowledge, per se. It is not a thing that is manageable. You can't manage lour or honor or patriotism of piety. It is clearly working with knowledge, but the words got there and there it is".

Others too, have recognized that to put up too much of a battle is probably fruitless, for the term has come into the language of management. Pragmatically speaking, the phraseology is not going away.

3. DEFINITIONS

In fact, Prusak and Davenport come up with their own definition of Knowledge that fits suitably in the organizational/ enterprise management arena:

Knowledge is a fluid mix of framed experiences, values, contextual information, expert insight and grounded institution that provides an environment and framework for evaluating and incorporating new experience and information. It originates and is applied in the minds of knower. In organizations, it often becomes imbedded not only in documents or repositories but also in organizational routines, processes, practices, and norms.

At the same time that attention was given to knowledge as it is found in the organizational management environment, much attention also was given to the related concept of intellectual capital (defined earlier, for the purpose this essay). Obviously that term could be substituted, in many situations,

for enterprise or organizational knowledge as described by Davenport and Prusak. Characterized by Thomas Stewart (the Fortune magazine writer who early on distinguished KM as an important organizational activity) as "the sum of everything everybody in a company knows that gives it a competitive edge "Intellectual capital is now recognized as an important if not the most important organizational asset.

As for defining KM itself (as opposed to defining knowledge), the literature supplies many definitions, all of which seem to approach some version of the opening paragraphs of this essay. Of course it is impossible to present all of these in this paper, but the following selection can provide the reader with enough elements to be useful.

The management of organizational knowledge for creating business value and generate a competitive advantage. An effective knowledge management strategy is a well balanced mix of technology, culture change, new systems, and business focus that is perfectly in step with the company's business strategy.

The systemic process of identifying, capturing, and transferring information and knowledge people can use to create, compete, and improve.

The identification, creation, collection, integration, and delivery of information to best leverage decision making and effectiveness. A technique that incorporates systematic processes of finding, selecting, organizing, and presenting information in a way that improves an employee's comprehension and use of business assets.

Putting all of this together, it can be seen that KM is an overall organizational management methodology for making relevant information available quickly and easily for people to use productively in practical terms, KM is best thought of as a way of doing business, a management methodology that is used to help an organization or an enterprise manage both explicit an tacit information in ways that promote it reuse and the creation of new knowledge. Or put another way, it is a management style for making relevant information readily available or for the creation of new knowledge, so that users can make timely valid decisions. Within the larger management community, KM is recognizing as a management approach that leads to the establishment of an atmosphere or milieu, a culture if you will. It is an environment in which the development and sharing of knowledge at all levels within the organization and including all levels of knowledge are accepted as the essential element for the achievement of the organizational or community mission.

Within this context, one definition that is suitable moves comfortably from what KM is to what is practitioner's knowledge managers do. In some enterprises, the move to KM has led to the establishment of staff positions specifically associated with the role of knowledge in the organization. These staff members, known as knowledge managers, are engaged to identify, organize, and make available for dissemination as needed the organization's tacit and explicit knowledge ; to ensure that it is exploited for the full advantage of the organization; and, not incidentally, for the creation, development, and exploitation of new knowledge. In the workplace, that advantage is specifically achieved as the organization manages both internal and external knowledge for its own purposes and, in one well-known practice (and not surprisingly), applies KM as it pursues its competitive intelligence goals.

The acceptance of the value of organizational knowledge has also led, inevitably, to the establishment of a senior management position with organizational responsibility for an enterprise-wide KM overview. The titles for these positions vary, but they generally are some combination "Chief knowledge Officer" (CKO). In a knowledge- centric competition- focused enterprise, the CKO has responsibility for

ensuring that the company's commitment to knowledge management contributes to the successful achievement of the company's mission. The CKO has responsibilities in corporate management, in the design and/or implementation of the organization's strategic (performance- centered) learning, and in most enterprises in which there is a eko-in serving as the organization's knowledge spokesperson. The duties of these managers, within this structure, can be listed:

4. CORPORATE MANAGEMENT

- Leads the corporate KM strategy, creating and selling the KM vision, and helping other organizational leaders drive the company in the desired direction.
- Promotes an organizational cultural that facilities tacit and explicit knowledge development and knowledge sharing; recognize and promotes enterprise- wide knowledge development/knowledge sharing contributors.
- Champions the development of a KM budget and serves as an advocate for keeping KM resources available.
- Evaluates the effectiveness of KM projects and their contribution to the corporate mission; benchmarks with other organization (public and private).
- Develops strategies, in cooperation with the established training and development operation, to facilitate training and education for knowledge workers.
- Champions cross-organizational communities of practice.
- Establishes relationships with related leaders: Human Resources, Organizational Learning, information technology (IT) company librarians/records managers/ archivists, etc.

4.1 Corporate/ Organizational Learning

- Develops common definitions to facilitate an enterprise wide understanding of knowledge concepts.
- Educates the leadership and employees about KM and its benefits to the successful achievement of the company's mission.
- Defines roles, skill-sets, and career opportunities of knowledge workers.

4.2 Corporate Knowledge Spokesperson

- Leads the KM effort among the company's leadership, employees, customer's suppliers, and other information/knowledge stakeholders.
- Creates opportunities to bring the company's KM "message" to the wider corporate/scholarly community.
- Authors books, scholarly papers, popular articles, electronic document, etc., describing the company's KM success.
- Speaks, appears on panels, etc. for professional conferences, etc.

5. WHY KM IN THE ORGANIZATIONAL MANAGEMENT ENVIRONMENT?

With this background, it is not difficult to see why KM has become a useful activity in the organizational management environment. Information has always been a critical resource in the workplace, and the recognition of its importance has grown significantly in the last third of the twentieth

century the much discussed "information age." during that same time, though, the techniques for the management of information were fairly well established, through the work of information scientists and others. The result has been that at the beginning of the twenty-first century, no one seriously argues that the management of information and information use is an unimportant or "fringe" activity. Employees and other stakeholders in the modern organizational enterprise live and work in an information-intense environment.

At the same time, though, the workplace changed, for with the development of techniques for the successful management of information, the organizational environment was changing from being an information-centric workplace to being a knowledge-centric one. It becomes a workplace in which worker productivity (that is, knowledge worker productivity) is based on different criteria and different standards than those used in the past.

This is an area that has been explored often, most usefully by Peter F. Drucker in his excellent guide to management in the new century. In the book, particularly in the section labeled "knowledge worker productivity", Drucker offers a convenient and skillful checklist that can be usefully adapted for those who have management responsibility in the knowledge-centric organization or enterprise:

- Knowledge worker productivity demands that we ask the question: "What is the work?"
- Knowledge worker productivity demands that we impose the responsibility for their productivity on the individual knowledge worker themselves. Knowledge workers have to manage themselves. They have to have autonomy.
- Continuing innovation has to be part of the work, the task, and the responsibility of knowledge workers.
- Knowledge work requires continuous learning on the part of the knowledge worker, but equally continuous teaching on the part of the knowledge worker.
- Productivity of the knowledge worker is not-at least not primarily-a matter of quantity of output. Quality is at least as important.
- Knowledge worker productivity requires that the knowledge worker is both seen and treated as an "asset" rather than as a "cost". It requires that the knowledge worker want to work for the organization in preference to all other opportunities.

In the new century, it must to be remembered that few knowledge workers are interested in information for its own sake. What people require for their work is knowledge, and what was known as the "information age" has become, in effect, the "knowledge age," and few any longer seek information qua information. Instead, what knowledge workers do with information, once it has been identified, is to take it and codify it, analyze it, interpret it, and use it to learn something new (and, ideally, they then share what they have learned with others who can use it). In the modern organizational environment, workers have gone from seeking information to seeking Knowledge.

The route to that knowledge not only utilizes KM as a management practice, it also incorporates organizational learning or as it is referred to in some companies, "strategic (performance- centered) learning." Learning, training, and development are all part of knowledge –transfer application in the organizational environment that permits knowledge workers to transform information into knowledge and to use it for organizational purposes. In the business community, Michael Miller has identified five factors that lead to building a business case for a formal knowledge management/organizational learning operation:

- the competitive marketplace;

- the convergence of financial service;
- mergers and acquisitions;
- the mobile work force; and
- the changing employment contract.

Related to this changing employment contract is its requirement that employees react differently than they did in the past to the organization's customers. With respect to information services, the customers, too, are experiencing changes in their workplace, and their perceptions and expectations of what quality information delivery should be have changed. If organizations are to succeed in servicing their customers, those changes must be recognized, and approaches and programs for delivering information must be adjusted to meet the customers' new and different perceptions and expectations. Knowledge management provides the framework for ding that, and the move toward KM makes sense in most enterprises because of its emphasis on the customer (whether internal or external). In the modern, well-managed organization, much attention is given to "client relationship management (CRM)," but whether the methodology is called "customer service" or "client relationship management," KM provides customers with better service.

5.1 KM Components

The components of KM are popularly identified as "people, process, and technology". There is, as can be seen from the Brown and Duguid quotation referenced earlier, considerable tension among the various departments in organizations and enterprises where the responsibility for "people," "processes" and "technology" do not overlap. In fact, the tension can sometimes be described as almost hostile, as can be seen from some of the comments of those who write about KM in the organizational management environment. Obviously without the advantages of technology it is not referred to as "enabling technology" for nothing), KM would not have evolved as a management philosophy and practice. On the other hand, as Cheryl Lamb notes, with respect to KM success, "it is the people and processes supported by appropriate technologies that deliver real results."

Sadly, in some organizations, it seems that the "KM=IT" formula has been accepted as fact, as Eric Berkman has pointed out:

Knowledge management revolves around the concept that one of the most valuable corporate assets is the experience and expertise floating around inside employees' heads. In order to manage this intellectual capital, executives must devise a way to capture and share that knowledge with coworkers. If done right, KM is supposed to create a more collaborative environment, cut down on duplication of effort and encourage knowledge sharing-saving time and money in the process. The problem is, in many cases KM devolved into a purely technical process, resulting in expensive software implementation sitting unused by oblivious, fearful, or resentful employees.

Such a bleak scenario can be avoided, if the components of KM are identified and understood by enterprise decision makers early on, as the organization moves to becoming a knowledge-centric enterprise. There is not agreement on which components precisely create a KM management practice, but Cheryl Lamb, in the essay cited above, makes a useful and workable attempt as she identifies what she calls the four "key components" to the organizational knowledge "backbone:"

- Organization of knowledge using a normalized taxonomy that enhances the goals of an organization.

- Availability of information/knowledge when and where it is needed through high-end intelligent access.
- Ability to connect knowledge with the people who created it (pairing knowledge with experts).
- Publication of knowledge so it can be reused and further shared.

Beyond these, which Lamb refers to as "the human element" (and for which she requires, correctly, a collaborative environment encompassing facilitation, navigation, and validation), other KM elements evolve, and a KM initiative (for any organization) will include the following, probably in this order:

- Define KM (as practiced in the company or offered to the company's customers, if it is a consulting company);
- Identifying what knowledge is critical for organizational success;
- Identifying the customer need (again, determining whether the process is to be for internal or external customers, or both);
- Analyzing the identified need (the information/knowledge audit);
- Inventory of knowledge already existing in the organization;
- Analysis of knowledge already existing In the organization;
- Provisioning/program design, including attention to processes, and incorporating both tacit and explicit knowledge;
- Implementation; and
- Utilization.

As can be seen from this list of components, innovation and collaboration are essential elements in any organizational move toward a KM philosophy/practice for the enterprise. In fact, the collaborative workplace has been identified as so important that there are some, like Edward M. Marshall, who are convinced that enterprise management in the future will be built on a collaborative framework. Such a point of view has significant implications for those organizations in which senior management is beginning to think about embarking on a KM "journey." As he defines collaboration " a principle-based process of working together, which produces trust, integrity, and breakthrough result by building true consensus, ownership, an alignment in all aspects of the operation," Marshall points out that, put another way, collaboration is simply "the way people naturally want to work". The idea is so important, in Marshall's way of thinking about the organization, that he sees collaboration as playing a critical role, perhaps even more cortical than is being anticipated. "Collaboration," Marshall asserts, "is the premier candidate to replace hierarchy as the organizing principle for leading and managing the twenty-first-century workplace."

6. STRATEGIC LEARNING IN THE KNOWLEDGE –CENTRIC ORGANIZATION

These components, variously described, provide a neat segue for looking at the role of corporate culture and how what is being referred to in some organizations as strategic (performance-centered) learning, or organizational learning, is incorporated into the KM practice. For KM to be a success, attention must be given to the design and implementation of serious learning, training, and development programs. Strategic learning is defined as the successful achievement of skills, competencies, knowledge, behaviors, and/or other outcomes required for excellence in workplace performance. In other words, what is learned is application based, and it must relate directly to how it will be used. In the Knowledge-centric enterprise, in which KM is the established management philosophy/practice,

Knowledge Development/Knowledge sharing (KD/KS) is "a framework for learning that embodies the highest objectives of knowledge management, and combines them with the basic principles of the learning organization and the teaching organization... Knowledge Development/ Knowledge Sharing builds on the assumption that all learning stakeholders accept their responsibility to develop, to learn, and to share both tacit and explicit knowledge within the enterprise. The concept of KD/KS exists for the benefit of the organizational enterprise with which the leaning stakeholders are affiliated and which Provides support for their learning endeavors, and for the growth and development of these stakeholders as lifelong learners."

As developed in the knowledge-centric enterprise, there are very distinct attributes to strategic (performance-centered) leaning. As noted, it combines knowledge development with knowledge sharing. It provides training/learning that is specific to the workplace. Leading from that, it focuses on applications. Learning for the sake of learning is not dismissed, of course, but in the KM environment, leaning is related to doing something. This learning, based on knowledge development and knowledge sharing, is specifically and directly didactic.

7. TANGIBLE AND MEASURABLE BENEFITS

While conventional wisdom generally would not be expected to allow for the measurement of intangible benefits in the knowledge- centric workplace, in fact metrics are being developed and are coming more and more into use. The international federation of Accountants, for example, provides introductory documentation about "The Measurement and Management of Intellectual Capital" in its "Standards and Guidelines." Likewise, the U.S. Securities and Exchange Commission has offered symposia and provided information about dealing with intangible assets.

Amrit Tiwana has identified three possible approaches to the measurement of KM success in organizations: benchmarking, the house of Quality/ quality function deployment (QFD) method, and the balanced scorecard approach. Benchmarking, applied in the business community with considerable success, is defined by Tiwana as "an undertaking of companies that aim to emulate the ways things are done best, anywhere within or outside their firm, industry, or sector." House of Quality/ QFD, developed by J. Hauser and L. Clausing in the late 1980s, is a methodology that has been successfully adapted, as Tiwana notes, to link customer needs to business processes and internal decisions. The balanced scorecard provides a technique to "maintain a balance between long-term and short-term objectives, financial and no financial measures, lagging and leading indicators, and between internal and external perspectives."

For the measurement of KM success in the information/knowledge services community, Frank H. Portugal has identified four approaches, including the traditional (but difficult, in matters having to do with information/ knowledge services) return-on-investment and cost-benefit analysis. These can be used, of course, in any situation where the workplace profile has been developed and work processes defined (in terms of KM and its application in the enterprise), but Portugal's other methodologies will probably be more useful in most information/knowledge services situations. These are:

- Knowledge Value-Added: used to evaluate the relative amounts of knowledge an intangible asset embedded in corporate sub processes.
- Intranet Team Forums: uses the passage of key information and communications through a channel that can track discussion, either in chronological order or by individual topics (threaded discussions).

- Intellectual Capital Valuation: tracks the growth of the intangible assets of a corporation.

Certainly other metrics for information/ knowledge value may be identified as well, and these, too, when appropriate, should be considered for use in any organization or enterprise considering the move to a knowledge- centric environment.

As a management philosophy and practice, KM's future will be determined by its effect in the workplace. Surely knowledge, as an organizational asset, will continue to be recognized a framework through which organizational success is achieved. Whether knowledge, per se, will continue to be singled out and dealt with as an individual or "stand-alone" asset cannot be predicted, for knowledge is by its very nature something that "relates" to something else. How important knowledge is in the enterprise in any enterprise- must, of necessity, be based on the importance of the thing it relates to. Knowledge for its own sake, especially in enterprise management, is valued of course, but what the workplace values with respect to knowledge is the end product what the knowledge leads to.

Nevertheless, there are signs that KM will continue to be a valuable activity. For one thing, for most knowledge workers, the early years of the twenty first century are an age of specialization; these employees are, by and large, in the expertise business. In the knowledge centric environment, KM leads to better management and better productivity because it enables knowledge workers to share and to benefit from sharing there expertise. Most knowledge workers are specialists, and the environments in which they works require that their specialties, as such, be know about and that their expertise be shared, when appropriate, with others throughout the enterprise and (again when appropriate) with stakeholders throughout the enterprise realm, with all who are officiated with it. KM is the environment in which this sharing of expertise flourishes.

Related to this sharing, and to how workers share knowledge, most managers now agree (in principle, if not always in practice) that the future of business management is expected to build on collaboration, as Edward marshal has suggested. That collaboration takes on structure when the organization's leader seeks to refocus the organization as a "learning organization". As promulgated by Peter Senge and those who have followed his lead: superior performance depends on superior learning. The impulse to learn is at its heart an impulse to be generative, to expend our capability in the learning organization, leaders are responsible for building organizations where people are continually expending there capabilities to shape their future. The structure is completed, in the knowledge-centric organization, as that learning organization is broadened, logically enough, into the "teaching organization" as advanced by Noel Tichy and Ely Cohen:

The concepts underlying learning organizations are valuable. But to succeed in a highly competitive global marketplace, companies need to be able to change quickly; their people must be able to acquire and assimilate new knowledge and skills rapidly. Though learning is a necessary competency, it's not sufficient to assure marketplace success.

Teaching organizations share with learning organizations the goal that everyone continually acquires new knowledge and skills. But to that they add the more critical goal that everyone passes their learning on to others. Collaboration, learning, and teaching are the very fundamental of KM, and when they are the combined in the knowledge-centric enterprise, the organization's strength is, indeed, in the knowledge of its people.

So it would seem that KM, once developed will be Institutional and "forever." Perhaps not, for the organization's greatest challenge is going to be the continued evaluation of the knowledge-sharing environment simply because, as has been demonstrated time and again in the organizational

management environment, human beings do not, by and large, take fondly to change. Nevertheless, it has been proved that such attributes as sharing, working harder, embracing change, and building a more collaborative workplace make for better work, and that, in the final analysis, is what the enterprise requires of its workers and of its managers.

As such, the enterprise and its leaders may simplified themselves "absolving" KM into managerial construct, much as happened with total quality management (TQM) and competency based management, two vary important management directions that were given much attention in the latter years of the twentieth century. In fact, Tom Davenport has been known to take such a position, when asked to make predictions about KM and its future. In the article from Eric Berkman, quoted earlier in another context, Berkman noted that it is Devenport's idea that KM will as happened with TQM-be absorbed into management practice in general, and will eventually be just a part of the general management methodology utilized by organizations and enterprises:

There are real business reasons- like increased productivity, worker collaboration, and shorter product development cycles- to keep track of who knows what. Thus, experts predict that KM practices won't go away; rather, they may become embedded in other disciplines, such as customer relationship management are enterprise resource planning. As long as the process lives on, it's really a victory for KM's legitimacy. Tom Devenport Likens KM to total quality management, which was all the rage in the early 1990s. Although TQM isn't mentioned much these days it has become incorporated in to the way we think about business, he says. "It would actually be a sign of success if knowledge Management got embedded into other things, "says Devenport, who has written extensively about the subject. "I'd certainly have no problems with its going into CRM and business intelligence.

Others, too, have commented that KM might simply be part of a larger management construct, as an element that has been separated and given attention for a few years (perhaps to ensure that we "get it right"?). Once KM's legitimacy as an integral and critical component of that management construct has been established and incorporated in the practice of management in general, it will probably cease to be the center of attention and emphasis it currently is. Was that what Lloyd Baird and John Henderson were discovering when they were writing there paper? Perhaps, for their experience was just that, discovering that KM is, indeed not a stand- alone or "separate" activity-it's just what leader's do:

If this "direction" as it might be labeled is realized, then the future of KM is assured. Its utilization and its integration into management practice can only result in better work, and that, in the final analysis is way management as a philosophy and as a practice exists in the first place.

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Knowledge Management in Service Oriented Organizations for the Knowledge Society: Brightens the Customer Friendly Quality Services

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Abstract: Knowledge Management as a precise science can create wonderful results in any service oriented organizations like banks, hospitals, libraries and information centers. Customers can be delighted with every services and transaction, becoming richer and more productive. Successfulness of service oriented organizations of the 21st century will be those do the best capturing, storing and leveraging what their employees or manpower know. Now days the service sectors organizations are facing multifarious challenges and opportunities in the knowledge driven society and at the same time the service oriented organizations picking very past in terms generating contributing the knowledge economy. Authors of this paper having blended experience both in Commerce and library and information science sectors, made an attempt to discuss various issues related the knowledge management principles and its application in the service oriented organizations. This kind of multidisciplinary approaches and studies provide a good platform for discussion during the conference and exchange many thoughts and ideas among the professionals. The paper suggests many marketing plan, strategies for making the services more relevant, qualitative, and customer-specific and knowledge society specific. There are many service oriented organization in the society but authors are restricted to discuss in this paper banking and library sector only is because banking sectors and libraries are directly deals with customer or users.

Keywords: Knowledge Management, Marketing, Service Oriented Organizations, Banks and Library and information centers.

1. INTRODUCTION

The service industry has always been a vital component of all economics. It has become more so in these days of globalization and liberalization. Starting with the agricultural and the industrial economy, the emphasis has no focused towards the service economy. In India, service industry has been given due recognition as being crucial to the knowledge economy. For example Banking and Library is a service industry. The products generated by its services, which are multi-furious in nature. Banking institutions are no longer expected to act as traditional mobiliser and deployer of financial resources in a particularly country. At the same time libraries and information centers also building and management of library resources. Now, they are acting as catalyst of change in the quality conscious service oriented sectors. Rapid pickup of globalization and liberalization, several sweeping changes has taken place in the financial sector.

Now we are living highly knowledge based society where banks and libraries cannot sell services which are not customer specific. Under the umbrella of marketing principles and changing buyers needs, wants and demands the service sectors organizations like libraries and banks are have to act as providers of quality services in buyers' market rather than seller's market. They are entering in market driven simple service environment moving beyond the horizons of directed banking and information centers. In views of this, the service oriented organizations have to adopt modern strategic marketing philosophy, besides maintaining temp of operational management of their services.

Considering this background, a modest attempt is made in this paper to discuss the need for strategic planning for marketing library services, strategic planning process and different types of marketing strategies for making the service oriented organization's services more relevant, qualitative, and customer-specific and knowledge society specific.

2. KNOWLEDGE-BASED INDUSTRIES: SOME THOUGHTS

Two centuries after Adam Smith recognized the potential role of manufacturing in transforming society, the wealth of nations is more than ever linked to the creation transformation and capitalization of knowledge. Knowledge-based industries are expanding faster than any other industries, and are transforming the economic infrastructure of many countries. The importance of knowledge for achieving competitive edge has been recognized since the early 1990s, but it is only recently that formal systems for managing the acquisition and use of knowledge have begun to emerge. Onslaught of Information and Communication Technologies (ICTs) are playing its role enormously in the process. Many scholars explored the potential for knowledge management in the industries, baking system and service sector as a whole, and demonstrated how some service oriented organizations are successfully using knowledge management to improve both customer relationship and stockholders or customer value.

Knowledge management is being viewed from two perspectives: (a) Social academics – which emphasize the process of knowing, and (b) Technological – which includes people who believe that knowledge is refined and processed information. This debate concerns practical issues in knowledge management and poses a question should services organizations focus on knowledge as object or as the process of knowing. If one takes the view that knowledge is primarily tacit and resides in people's minds, better knowledge management will require better management of knowledge workers or mangers. Either way, it is clear that people, process and tools must network well to make it worthwhile.

3. INFORMATION AND COMMUNICATION TECHNOLOGY: A ROAD MAP KNOWLEDGE MANAGEMENT

The world wide revolution in Information and Communication Technology (ICT) brought forward the unusual changes in the banking as well as library and information centers. It is a source of productivity growth and facilitates effective competition. ICT reduces cost, increases volume and facilitates customized products and services. It plays an important role in knowledge management process. Technology has opened up new avenues in service oriented organizations for discharging the same function in a cost effective manner.

Knowledge management as the process of generating, accumulating, sharing and using knowledge to create and restore value in the libraries – is maturing. Knowledge management has been widely reported in books, journals, magazines, internet discussion groups, conferences and list forums to be one of the key IT, as a key enabler to knowledge management, provides the foundation for solutions that automate and centralize the sharing of knowledge and fuelling the innovation process. Knowledge management can be broken down into various stages viz., knowledge generation, codification, storage, transfer and application. ICT can be used to help in various stages of these knowledge lifecycles.

4. CONCEPT OF PRODUCT

The term product in banks and libraries are one and same i.e., a set of services designed to varied needs, motives, styles, values etc., of bank as well as library customers. It is a want-satisfying

commodity created and delivered by bankers for customer's satisfaction. Like any other tangible product in industrial sector, the structure of product consists of different components like core component, augmented component, ancillary service component etc. In banks the products are may be deposit-based service or credit based service or other ancillary service. For example, in case of deposit-based services, providing a place for investment is core component, deposited related features like safety, liquidity marketability and profitability of investments constitute augmented deposit investment counseling, tax planning and post deposit loan facility, credit and debit-cum ATM cards and travelers' cheques, constituting ancillary service component. In case of libraries products may be a books, journals, databases, reference sources etc. both print as well as non-print including online resources and even some time good and quality personnel also considered as a product both in library and well as banking sector. Therefore the study of knowledge management principles and thought need of the day in the service oriented organizations. However, the composition of these services provided by the service oriented organizations depends upon the type of the customer.

5. STRATEGIC MANAGEMENT OF CUSTOMER SERVICES

Having a shared view of the future and agreed to overall strategy reduces the burden of day-to-day planning and decision-making. If strategic objectives and priorities have been decided and communicated, people at the front line can take decision and actions within a framework that enables them to respond quickly and flexibly to customer needs.

During 20th century, strategic planning had a bad press, as the gurus struggled to adapt established framework to the complexity and dynamics of the contemporary world. But in the 21st century have been a resurgence of interest in strategic planning generally, and particularly in the development of information and knowledge management, signaling the importance of intellectual capital as a knowledge economy.

The best strategy process has been streamlined and simplified to reflect the current environment, with much shorter timeframes and slimmed-down documentation. In other respects, the process has become more expansive, with more stakeholder involvement and acknowledgement that environmental scanning, strategic thinking and project planning must be a continuous activity – not a 'one-off' exercise.

5.1 Strategic Planning Process

In order to devise an appropriate customer service mix, the service sectors have to formulate the appropriate operational strategies, which requires an adherence to the following steps involved in the process of formulating an appropriate customer service marking strategy;

- Defining the purpose of the service business;
- Defining the scope of customer services to be rendered;
- Specifying the target market;
- Specifying the target customer;
- Analyzing the external environment;
- Formulating an appropriate customer service marketing strategy;
- Implementation of strategy, and
- Evaluation and follow-up action for making a change in the scope and scale of service mix.

5.2 Marketing Strategies for Customer Services

In the competitive environment the banks and library and information centers are committed to provide right services at the right time, at right place, at right price and to a right customer in an customer preferred format and model. There must be perfect matching between service provided by the system and service needed by the customers. They have to device future oriented, integrated and environment sensitive service marketing strategies.

Successful operations of the banks as well libraries depends on the thoughtful formulation of strategies for marketing their services keeping in view; (a) Customer groups being served and to be served (b) Customers needs, wants and demands being served and to be served. In the light of these two factors, the following strategies may be formulated and implemented.

5.3 Marketing Penetration Strategy

It is an act of satisfying the present needs of the present customers. This strategy aims to avoiding possible loss due to probable obsolescence of literature, technology and banking services on account of ever changing environment; because satisfying the same need of the same customer over a span of time results in diminishing marginal utility for a service.

5.4 Market Development Strategy

It is strategy of satisfying current needs of new customers. This strategy aims at increasing the customer expectations from the system and its profitability by covering untouched market segments by proper sales promotion policies.

5.5 Product Development Strategy

It is a strategy of satisfying new needs of present customers. Basically, customers' needs are repetitive, multiplicative and dynamic in nature. They go on varying in nature and number with the march of time. Therefore, this strategy aims at exploring the new wants, demands and thereby innovating new services for example in banks – new deposit schemes, credit schemes, ancillary service etc., in case of libraries – application of Web 2.0 to Library 2.0 services.

5.6 Product Diversification Strategy

It is a strategy of satisfying new needs of new customers, besides the routine products. Developing new products for the existing customers in the form of online service like subscribe to RSS, creating a separate portal for access to e-resources and make A-Z list for access to e-journals, ask librarian to handle all types of reference services, Online ILL and Document Delivery Service for remote users, discussion forum for interaction among the professionals etc. These products can be developed for both local and global customer requirements.

5.7 Strategic Customer Relationships

Although the decision ultimately rests with the customer as to whether or not a relationship will exit. Libraries and banks can play a part in influencing this decision. However, this needs a carefully planed through a viable strategy and a genuine understating of customers. The knowledge managers are needed to find out about customers whole lives, not just the time that they use products and services of the bank and libraries. Customer relationships may be maintained with continues interaction in the form meeting, get-together, as well as organizing a information literacy programme from time to time for the mutual understanding and benefit.

5.8 Promotion/Communication Strategy

Some times the good products and services not get attracted or ever popular is because lack of advertisement for the product and a service. If they have the right products at the right customer, it is pointless if any body knows about it. Promotion includes advertising, distribution of pamphlets, leaflet, broachers, handouts, manuals etc. though this lets customers not only to know products and service but also help them to rain in the memory.

Most of the customers share their experiences and feelings with friends, neighbors and colleagues and focus on the good and bad of the products and services. These personalized sharing and recommendations are called word of mouth recommendations are more popular than formal advertising.

6. SOME IMPORTANT QUESTION ABOUT CUSTOMER SATISFACTION FOR MEASUREMENT FRAMEWORK

These questions may not be a comprehensive one but we have listed on the basis of experiences and published and unpublished literature. For the purpose of these questions we have raised for the discussion during the ILA-TISS international conference time for better understanding of changing needs of customers in deferent services oriented organizations. Finally we are planning elaborate it for each and every service sectors including strata service sectors such as public library customer, academic library customer, special library customer, corporate library customer etc.,

6.1 Customers

- Do you know who your customers are and how many customer you have?
- Do you listen effectively to all your customers?
- Do you regularly make up an inventory of all the needs and expectations of your customers?
- Are complaints replied to within a day and solved within a day or two?
- Do you make recommendations to customers about the products and service that best suit their needs?
- Do you know what the costs are when you lose a customer?
- Do you regularly organize meeting with customers groups to learn about their needs, wants, demands, ideas and even complaints?

6.2 Leadership

- As a manger, do you know how many complaints are received daily, monthly and yearly?
- Is there commitment at top-management for customer orientation?
- Does management set a good example with regard to customer friendly behaviour?
- Is management at all times available to the customer?
- Does customer satisfaction also belong to the evaluation criteria of management?
- Does top management also personally handle complaints of customers?

6.3 Policy

- Is customer satisfaction part of your organization's vision
- Is the customer satisfaction policy continuously communicated to all employees?
- Is there any code of conduct or ethics?

- Do you involve your customers with the execution of improvement processes in your organization?
- Do you have an up-to-date databank in which all characteristics of your customers are registered?

6.4 Product, Service and Process

- Are products and services delivered within the period expected by the customer?
- Is the phone in your library/reference desk answered within three rings in more than 90% of the case?
- Do supporting departments within your library and information centre guarantee quality of the work they deliver?

6.5 Human Resource Development

- Do you have an induction programme in which new employees are also educated concerning importance of satisfied customers?
- Are customer orientation and continuous work towards improvement criteria for promotion?
- Do you stimulate your employees to generate ideas about increasing customer satisfaction?
- Are the employee's interest and the interest of the customer related?

Asking these questions won't reveal everything one needs to know in an instant, but it's a beginning. Making a conscious effort to listen to the customers is a necessary step down the road to providing, genuine, quality, customer-oriented customer service.

7. CONCLUSION

Capturing, consolidating, storing and managing knowledge – whether explicit or tacit – has implication for innovation, cost cutting and improved competitiveness. Knowledge management can substantially enhance individual and group productivity in the organizations by allowing the use and reuse of knowledge during day-to-day activities as well as in doing strategic tasks such as customer relationship development. If the organization does not purse active knowledge condition and sharing strategies, they may lose critical tacit knowledge.

In genera, knowledge management initiatives in service sector organistions fall into two main categories. First, knowledge management is seen as an integral part of overall corporate strategy, and aims to grow, extract and exploit the organization's knowledge to increase stakeholders value. The second focus is on improving the knowledge necessary to carry out specific task processes and thereby improving efficiency.

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Knowledge Management: Is it Possible?

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Abstract: Discusses the development of management techniques, definitions and differences of information and knowledge in the light of explicit knowledge and tacit knowledge, characteristics of knowledge; importance of technology in knowledge management, key drivers of knowledge management and concludes with the pros and cons for successful knowledge management.

Keywords: Tacit Knowledge, Explicit Knowledge, Knowledge Management, Information Management

1. INTRODUCTION

The growth of 'Knowledge Management' (KM) as a strategy of consultancy companies is one of a series of such strategies dating from Taylor's (1911) 'scientific management' of the early part of the last century. 'Time and motion study' developed directly out of scientific management and continued into the 1970s as a widespread industrial engineering technique. In the late 1930s, the 'human relations school' emerged out of research between 1927 and 1932 at the Western Electric Hawthorne Works in Chicago (Mayo, 1933) and had a considerable influence in the emerging consultancy companies after the Second World War.

In the second half of the last century, the pace of new techniques quickened considerably: we have seen (not in chronological order and not a complete list):

'the repertory grid' → 'management by objectives'
'theory X and theory Y' → 'T-groups'
'the matrix organization' → 'Planning Programming Budgeting System'
'Zero-based budgeting' → 'organisation development'
'total quality management' → 'downsizing'
'organisational learning' → 'systems thinking'
'team-building' → 'cultural change'
'strategic information systems' → 'benchmarking'
'ISO 9000 certification' → 'the balanced score card'
'core competencies' → 'business process re-engineering'
'enterprise resource planning' → 'customer relationship managemen
and now
'knowledge management'

These have sometimes been called management fads and fashions, but it would be wrong to assume that, for that reason, they all lacked effectiveness when applied in organisations. Some, however, have been disastrous: Stephen Roach, Chief Economist at Morgan Stanley, was a strong protagonist for downsizing, arguing that it was the cure for any company's problems, but in 1997 he reversed that

opinion, arguing that, on the contrary, it could be a recipe for industrial disaster. Jenkins (1997) reports Cameron, a researcher in organisational behaviour, as saying that, "downsizing [is] the most pervasive yet unsuccessful change effort in the business world". Some techniques fail, or at least are dropped from the repertoire, because they are utopian in character: organisations are told that the technique must be applied throughout the organisation for the full benefits to be achieved. This was the case with Business Process Re-engineering (BPR), but businesses quickly realised that the costs of carrying out BPR throughout the organisation would be crippling and, because they attempted to apply the technique to only part of the company, the results were less than satisfactory – in fact, two thirds of BPR efforts are said to have failed (Hall *et. al.*, 1994). Knowledge management (whatever it is) also shows signs of being offered as a Utopian ideal and the results are likely to be similar.

2. KNOWLEDGE AND INFORMATION: DEFINITIONS AND DIFFERENCES

In management consultancy it is, perhaps, not too serious to fail to distinguish between related concepts (although I suspect that management researchers would not be happy with this proposition), but for the fields of information science and information systems, it is clearly necessary for us to distinguish between 'information' and 'knowledge'. Failure to do so results in one or other of these terms standing as a synonym for the other, thereby confusing anyone who wishes to understand what each term signifies.

Happily, it is quite easy to distinguish between 'knowledge' and 'information' in such a way as to remove ambiguity and, at the same time, demonstrate the fundamental nonsense of 'knowledge management'.

'Knowledge' is defined as what we know: knowledge involves the mental processes of comprehension, understanding and learning that go on in the mind and only in the mind, however much they involve interaction with the world outside the mind, and interaction with others. Whenever we wish to express what we know, we can only do so by uttering messages of one kind or another - oral, written, graphic, gestural or even through 'body language'. Such messages do not carry 'knowledge', they constitute 'information', which a knowing mind may assimilate, understand, comprehend and incorporate into its own knowledge structures. These structures are not identical for the person uttering the message and the receiver, because each person's knowledge structures are, as Schutz (1967) puts it, 'biographically determined'. Therefore, the knowledge built from the messages can never be exactly the same as the knowledge base from which the messages were uttered.

In common usage, these two terms are frequently used as synonyms, but the task of the academic researcher is to clarify the use of terms so that the field of investigation has a clearly defined vocabulary. The present confusion over 'knowledge management' illustrates this need perfectly.

The consequence of this analysis is that everything outside the mind that can be manipulated in any way, can be defined as 'data', if it consists of simple facts, or as 'information', if the data are embedded in a context of relevance to the recipient. Collections of messages, composed in various ways, may be considered as 'information resources' of various kinds – collections of papers in a journal, e-mail messages in an electronic 'folder', manuscript letters in an archive, or whatever. Generally, these are regarded as 'information resources'. Thus, data and information may be managed, and information resources may be managed, but knowledge (i.e., what we know) can never be managed, except by the individual knower and, even then, only imperfectly. The fact is that we often do not know what we know: that we know something may only emerge when we need to employ the knowledge to accomplish something. Much of what we have learnt is apparently forgotten, but

can emerge unexpectedly when needed, or even when not needed. In other words we seem to have very little control over 'what we know'.

The following chart (Sveiby, 1997) suggests how information and knowledge are distinguished:

Table1: Information and Knowledge

Information	*Knowledge*
Static	Dynamic
Independent of the individual	Dependent on individuals
Explicit	Tacit
Digital	Analogue
Easy to duplicate	Must be re-created
Easy to broadcast	Face-to-face mainly
No intrinsic meaning	Meaning has to be personally assigned

Knowledge is, after all, *'what we know'*. And *'what we know'* cannot be co-modified. Perhaps if we did not have the word "knowledge" and were constrained to say "what I know", the notion of "knowledge capture" would be seen for what it is – nonsense!

The more we consider these issues, the more we are driven to the unpalatable and counter-intuitive conclusion that information is intrinsically meaningless on its own and remains so unless and until it is interpreted by human beings, within some context. "*I = 0*" (information has no intrinsic value) is perhaps an elegant way of expressing this essential truth.

3. UNDERSTANDING TACIT KNOWLEDGE

Organisational knowledge is frequently categorised into typologies. For example, Nonaka and Takeuchi (1995) identify tacit and explicit knowledge; Choo (1998a) sees three different types of knowledge (tacit, explicit, and cultural); and Boisot (1998) describes four types (personal, proprietary, public knowledge and common sense).

Tacit knowledge seems to be the primary concern of KM writers and has been a great deal of discussion in the literature about its nature. Tacit knowledge is defined as action-based, entrained in practice, and therefore cannot be easily explained or described, but is considered to be the fundamental type of knowledge on which organisational knowledge is built (Nonaka & Takeuchi, 1995; Choo, 1998a). Nonaka and Takeuchi (1995) and other authors claim that "tacit knowledge is not something that can be converted into explicit knowledge". Although most KM writers cite Polanyi (1962), who drew a distinction between tacit and explicit knowledge, they often overlook a part of his writings emphasizing the personal character of knowledge and knowing. For Polanyi, tacit knowledge cannot be expressed because "we know more than we can tell". Therefore, we cannot articulate what we know with words because we are not fully conscious of all the knowledge we possess. It resides and remains in the human mind. Polanyi (1962) illustrates this with the example of a medical student learning how to read X-ray pictures by listening to experts reading them. Exposure to empirical material and specialised language combined with the learning of medical knowledge will enable the student to become an expert, but tacit knowledge remains tacit. For Nonaka and Takeuchi (1995), tacit knowledge can be transmitted through social interactions or socialisation, and made explicit through externalisation- although they agree with the idea that tacit knowledge is somewhat hidden. These very different perspectives are a reflection of different backgrounds: Polanyi is a philosopher concerned with

individual knowledge while Nonaka and Takeuchi are organisational theorists interested in how knowledge circulates in organisations.

Explicit knowledge, unlike tacit knowledge, is defined as knowledge that can be codified and therefore more easily communicated and shared. KM writers view explicit knowledge as structured and conscious and therefore it can be stored in information technology (Martensson, 2000). This type of knowledge is often equated with information, providing the argument that KM is simply another terminology for Information Management (IM). However, the concept of information is far from clear-cut. "Information is a vague and elusive concept susceptible of being understood in a variety of ways" (Gourlay, 2000). In the IM literature, the distinction between information and information resources is also very innocuous. Both encompass many other terms such as data, words, records, documents and databases while information resources also include very different types of resources such as human beings (informal sources) and books and newspapers labeled formal sources (Choo, 1998b).

Considering that the concepts of both information and knowledge are unsatisfactorily defined and that the notion that tacit knowledge can be transformed into explicit knowledge is troublesome, some authors have suggested that the expression 'knowledge management' is perhaps misleading. Gourlay (2000), for instance, argues that knowledge itself cannot be managed and it is "knowledge representations" that are the actually focus of KM. And, Abram (1997) wrote that the knowledge environment, or the conditions of its use, are the only dimensions that are manageable. Hlupic et. al. (2002) citing Marshall and Brady, mention that given the complexity of knowledge, the depiction of types of knowledge, such as tacit and explicit, as mutually exclusive categories might be also misleading and prevent researchers to see the interrelated dimensions involved in the process of knowing.

While these arguments have merit, it is our contention that to consider information as the equivalent of explicit knowledge reveals an inadequate assessment of the qualitative dimensions of the various types of information and knowledge created, used and transferred in organisations. As Kakabadse et al. (2001) suggest, "information and data management are important pillars of knowledge management" but the later "encompasses broader issues and, in particular, creation of processes and behaviours that allow people to transform information into the organisation and create and share knowledge." The three different types of knowledge that knowledge management is concerned with are:

1. Explicit knowledge (information).
2. "Know how" or implicit knowledge (can be captured and codified as information).
3. Tacit knowledge (cannot be captured and codified as information).

For knowledge management to succeed, we need to treat knowledge as an activity and not an as an object. The minute an activity is transformed to an object, it should not be called knowledge but rather a piece of information. Therefore, information management systems are good in managing objects and not activities.

4. WHAT'S WRONG WITH THE TERM "KNOWLEDGE"?

Language (unfortunately) makes it possible to treat as 'objective' (i.e., explicit) what is only ever 'subjective' (i.e., tacit). For example

- "how I feel" (tacit) can become "feeling" (explicit)
- "being safe" (tacit) can become "safety" (explicit)
- "what I learn" (tacit) can become "education" or "training" (explicit)

- "how I relate to you" (tacit) can become a "relationship" (explicit)
- "what I know" (tacit) can become "knowledge" (explicit)

and so on.

This point is supported by the recent work of Pfeffer and Sutton (2000) who point out that "The ...problem with much of the existing literature and practice of knowledge management is that it conceptualises knowledge as something tangible and explicit that is quite distinct from philosophy or values....The noun 'knowledge' implies that knowledge is a 'thing'....Knowledge is embedded in ... shared spaces where it is then acquired through one's own experience or reflections on the experiences of others...Knowledge is intangible".

5. KNOWLEDGE AS A DICHOTOMY

The recognition that KM is a 'people' process and that knowledge is not simply an object marks a major shift in emphasis for KM. With the increased interest in knowledge that cannot be captured a number of researchers (e.g. Buckingham Shum, 1998; Swan, Newell, Scarborough and Hislop, 1999) have begun to realise that its management poses significant challenges and that existing approaches to KM are not adequate. This in turn has led to much debate about how to describe and theorise about such knowledge. Different KM researchers and practitioners use different terms to distinguish between the types of knowledge of interest to KM. Almost all of these views tend to see knowledge as a dichotomy.

For example, Conklin (1996) uses the terms formal and informal knowledge. He describes formal knowledge as that which is found in books, manuals and documents, and which can be easily shared in training courses. Informal knowledge is described as the knowledge that is applied in the process of creating formal knowledge. Rulke, Zaheer and Anderson (1998) on the other hand focus on the knowledge of an organisation, which they term transactive knowledge (the organisation's self-knowledge – knowing what you know) and resource knowledge (knowing who knows what).

Similarly Kogut and Zander (1992) differentiate between information and know-how, while Seely Brown and Duguid make a distinction between know-how and know-what.

"The organizational knowledge that constitutes 'core-competency' is more than 'know-what' explicit knowledge which may be shared by several. A core competency requires the more elusive 'know-how' – the particular ability to put know-what into practice." (Brown and Duguid, 1998)

Polanyi (1967) is often cited when describing tacit knowledge. Polanyi proposed a concept of knowledge based on three main theses:

1. True discovery cannot be accounted for by a set of articulated rules or algorithms.
2. Knowledge is public but is also to a large extent personal (i.e. it is socially constructed).
3. The knowledge that underlies explicit knowledge is more fundamental; all knowledge is either tacit or rooted in tacit knowledge.

Thus for Polanyi, tacit or implicit knowledge is knowledge that is known but cannot be told. It is the kind of knowledge that cannot be articulated because it has become internalised in the unconscious mind. It represents a level of understanding that cannot be externalised because it is "inaccessible to consciousness": put simply "we know more than we can tell."

6. WHAT IS 'KNOWLEDGE MANAGEMENT'?

Since the mid-nineties the label *'knowledge management'* has attracted much attention (Ponzi & Koenig, 2002) while information management has been used less. As with information management, there is no agreement on what constitutes knowledge management (Corrall, 1998; MacMorrow, 2001; Wilson, 2002a). According to Wilson (2002b), knowledge management is either used as a synonym for information management or for the 'management of work practices' which are to improve the sharing of knowledge in an organisation.

It is clear from looking at the literature on knowledge management (KM) that the term knowledge suffers from a high degree of what might be called "terminological ambiguity" and often requires a host of adjectives to make clear exactly in what sense it is being used. When something is to be managed many people feel that in order to do this it must be quantified, counted, organised and measured (Glazer, 1998); it must be able to be built, owned and controlled if its value is to be maximised (Allee, 1997). As a result, approaches to KM have tended to concentrate on attempts to capture and control what is sometimes termed 'structured knowledge'.

Initially KM was seen as an extension to Artificial Intelligence (AI) where knowledge was viewed as information: a commodity that can be codified, stored and transmitted. Expert systems were created to 'capture' the knowledge of experts. The 'capture' approach continued with an emphasis on 'capturing knowledge' in databases, manuals, books and reports, and then sharing it in a hard form. The emphasis was placed on managing so called 'knowledge assets' that were tangible, and could be structured and codified, such as patents, trademarks and documents. This view of knowledge as an object continues to dominate the KM field with some researchers still viewing the capture of knowledge as the main challenge for KM (Alavi and Leidner, 1997).

The capture/codify/store approach is technology-dominated. The most common use of technology in KM is to create a repository of so called 'structured knowledge' (Davenport and Prusak, 1998). As we have noted previously (Hildreth, Wright and Kimble, 1999; Kimble, Hildreth and Wright, 2001), what is presented as being KM is often simply Information Resource Management (IRM) with the new label. As Offsey (1997) notes:

"...what many software vendors tout as Knowledge Management systems are only existing information retrieval engines, groupware systems or document management systems with a new marketing tagline."

7. THE IMPORTANCE OF TECHNOLOGY IN KNOWLEDGE MANAGEMENT

Technology plays an important role in knowledge management, although knowledge management is not about technology. Technology facilitates the process of transmitting and exchanging information. It can be used to manage uncertainty and complexity, where information is more factual and a high degree of interaction is not required.

Technology enables individuals to coordinate the logistics of face-to-face meetings. It can also be used to catalogue expertise of organisational members and as a result facilitating access to the right people and enhancing knowledge sharing. Computer-mediated communication such as electronic mail or computer-conferences can help to maintain continuity and connection between conversations, especially for those in different locations (Marwik, 2001). One of the key technologies that is driving knowledge management is collaborative technology. Collaboration tools enable a company's professionals to work together and work virtually regardless of the geographical location. Web

technology allows organisations to build web and knowledge portals that can handle substantial amount of information and made it accessible to users anywhere anytime.

Knowledge management tools are technologies, broadly defined, which enhance and enable knowledge generation, codification (know how), and transfer (Ruggles, 1997). Typically, they are designed to ease the burden of work and to allow resources to be applied efficiently to the tasks for which they are most suited. It is important to note that information management tools are a subset of knowledge management tools. Information management tools allow organisations to generate, access, store, and analyse data, usually in the form of facts and figures. Information management tools enable the manipulation of information but do not capture the complexity of context and the richness of knowledge. While knowledge management systems may include tools that also handle data and information, data and information management tools are not robust enough to truly facilitate knowledge management. According to Ruggles (1997), an analogy is the difference between reading a description of the Mona Lisa and the deeper connections, which comes from seeing the painting itself. Knowledge tools can help us create, see, and share the paintings.

Duffy (2001) also made a distinction between technologies for knowledge management and technologies for information management. According to Duffy, information management primarily focuses on finding work-related objects and moving them around, while knowledge management concerns itself with finding and moving work objects as well as with how they are created and used. One other key distinction is that the means of creating, capturing, and communicating in knowledge management systems are very broad while the focus in information management tools tends to be on electronic and paper-based information. To support both explicit and tacit knowledge, a knowledge management system needs to be built with content and collaboration technologies. Data technologies are structured and typically numerically oriented; knowledge technologies deal most often with text. Knowledge technologies are more likely to need human interaction than data technologies because transactions are fewer and volumes lower, with interaction and iteration commonplace.

8. THE KEY DRIVERS OF KNOWLEDGE MANAGEMENT

For knowledge organisations where the worth of the company is heavily dependent on tacit knowledge, managing tacit knowledge and protecting intellectual property is important. Some of the key drivers for knowledge management in any organisation include:

Knowledge management plays a significant role in achieving organisational efficiency. In the new economy, speed and responsiveness are determining success factors, especially in the dot.com arena. Companies today face stiffer competition in a globalised market place. Davenport and Prusak (1998), highlighted that the globalised economy, with improved communication and transportation, provides consumers with unprecedented and endless parade of choices for goods and services worldwide.

Huang (1998), offered that responsiveness is a key to survival, including delivery of services, speed of implementation of global solutions and efficient processes. He added, 'continuous improvement in operational efficiency and productivity is essential to long term earning growth'. Indeed, in the Internet world where customer expect services to be available on a twenty-four hour basis, firms have no choice but to make the quantum leap improvement in various aspects of their services such as time-to-market, time-to-solution and time-to-delivery, or risk being forced out of business. This in turn created the need for organisations to have organised information to facilitate their operations, information that is timely, accurate, useful and more importantly tailored to organisation's need. There is also increased pressure on firms to recycle and re-use knowledge, instead of reinventing the wheel.

9. CONCLUSION

To answer the question 'Can we ever manage information and knowledge?', we have to ask ourselves whether we can ever manage 'what people know'.

Verna Allee (1997) puts it this way:

"There is no way I could possibly catalog even my own personal knowledge. What makes us think we can somehow catalog or map all the knowledge that resides in a complex enterprise of hundreds or thousands of people? What on earth do we think we can accomplish by 'managing' knowledge?"

Nonaka and Takeuchi (1995) also make the point:

"...information is a flow of messages, while knowledge is created by that very flow of information anchored in the beliefs and commitment of its holder. This ... emphasizes that knowledge is essentially related to human action."

Thus the notion that we can 'capture' knowledge becomes ludicrous, just as ludicrous as the notion that we can 'capture people's thoughts'. In fact, it is a useful test when attempting to understand the notion of 'knowledge' to exchange it for a moment with the word 'people', and consider whether the sentence still makes sense. If it doesn't, a more appropriate word would probably have been 'information'!

It is our contention that the focus of KM is not on the distribution nor the dissemination of knowledge but on its sharing. Although knowledge can be acquired at the individual level, to be useful it must be shared by a community, often described as a community of practice. For instance, if there is only one person knowing organisational rules and procedures, such rules and procedures would be useless and meaningless. On the other hand, rules and procedures emanate from communities and exist precisely to regulate group activities. Knowledge sharing is then crucial when new employees arrive and others quit. The management of information does not really focus on information sharing and is more oriented toward the control, preservation, and retention of information. One could also argue that the usefulness and the meaningfulness of information do not depend as much on its collective consumption or sharing: its individual consumption and use could be very effective from an organisational point of view. In fact, too much distribution of information can lead to information overload which could paralyse action. Knowledge sharing is perceived, for example, by the World Bank as critical for economic development and as an important next step going beyond the dissemination of information (MacMorrow, 2001). In the end, the cycle of knowledge management is neither complete nor successful if no efforts are made to ensure the use of stored and shared knowledge. On the other hand, the success of an IM project is achieved when the preservation and the retrieval of information is guaranteed while the success of a KM program ultimately depends on the sharing of knowledge (Martensson, 2000).

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Managing Inter-disciplinary Resources for the Development Sector: Experiments with Alternative Classification Models

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Abstract: This study is the result of a long exposure to the world of development workers, activists, NGOs and Voluntary Agencies working towards social welfare and empowerment of marginalized groups. While confronting the information needs of this sector and approaches towards documentation of development issues, it became evident that conventional taxonomies and standard classification systems with generic disciplines were unable to meet the requirements of knowledge organization and user-centric information management. Two problems emerged from this: (i) predominance of interdisciplinary *issues* and *perspectives* rather than broad disciplines or generic subjects, and (ii) knowledge resources in heterogeneous random *formats* to be made easily accessible and retrievable.

Alternative classification and documentation systems like Akshara Classification and CED Classification (developed by Mumbai based groups) often come as a manageable answer/solution to Information and Resource Centers of several NGOs and Voluntary Agencies, for knowledge organization and managing inter-disciplinary issues towards multi-dimensional activism. Information intermediaries and research librarians help to facilitate need-based activism with the help of these models. Some centers have also modified and re-worked on these systems while informal radical groups have developed their own ontology to suit the requirements and perspectives of development workers and activists.

The purpose of this study is to assess (a) how these alternative models are different from the conventional taxonomies in dealing with inter-disciplinary domains and relations within domains and (b) how they help in managing multi-dimensional patterns of information search & retrieval, thereby, contributing towards ideological cohesiveness and knowledge empowerment.

Keywords: NGOs, alternative classification, inter-disciplinary domains, information retrieval.

1. INTRODUCTION – WHAT ARE NGOS?

The Wikipedia defines: A *non-governmental organization (NGO)* is a non-profit group or association that acts outside of institutionalized political structures and pursues matters of interest to its members by lobbying, persuasion, or direct action. The term is generally restricted to social, cultural, legal, and environmental advocacy groups having goals that are primarily non-commercial. Because the label "NGO" is considered too broad by some, as it might cover anything that is non-governmental, many NGOs now prefer the term private voluntary organizations (PVOs) or Non Profit Organizations (NPOs).

The primary purpose of an operational NGO is the design and implementation of development-related projects. They can be community-based, national or international. They try to raise awareness, acceptance and knowledge through research, advocacy, and activism. NGOs exist for a variety of purposes, which include improving the state of the natural environment, encouraging the observance of human rights, improving the welfare of the disadvantaged, discriminated or marginalized, or representing a corporate agenda.

2. NON-PROFIT GROUPS AND KNOWLEDGE MANAGEMENT

In order to carry out their aims and objectives, NGOs need systems to manage the creation, accessing and deployment of information – within themselves, between different NGOs working together

and ultimately between NGOs and the Society as a whole. Sooner or later, their activism, research and advocacy lead them to accumulate or generate knowledge resources - *inter-disciplinary in contents, random and heterogeneous in formats*. At this juncture they realize the need to get organized through a library or a resource centre or a *knowledge management mechanism* – primarily, to keep a track on documentation and historical contexts of the information *and* also to ensure the easy accessibility of the resources, whenever required for reference or a follow-up.

2.1 Some attributes or special characteristics of the Resource Centre & Library

a) The focus is however, *not* on a conventional library or storage systems *but* on a customized *resource centre* which will create an environment of knowledge exchange amongst members *sharing a common goal or ideology.*

b) This resource centre is expected to be more of a meeting place rather than a quiet reading room of a traditional library which usually discourages communication exchange or verbal discourses. We may also come across activists and grassroots workers preparing campaign materials, engaging in collective activities like poetry reading, narrating field experiences, or discussing a common agenda for a group activity.

c) The nature of *information products* as outcome of research and activism, and *information services* rendered, are of a *unique nature*, very different from an academic library or the reference library of a research institute.

d) The emphasis is more on *dissemination* of information (reaching out) rather than on *acquisition* or storage. *Process Documentation* is almost a continuous activity.

e) The members are *not* expected to be conventional librarians or trained library professionals. The focus is not on a Library Science qualification. The *sensitivity towards development issues and the required perspective*, combined with an ideological belief, is important in managing information needs of activists, grassroots workers, students, researchers, media persons and stakeholders.

Our present study of knowledge management with regard to the development sector focuses on two issues:

A. Interdisciplinary and overlapping subject domains emerging from development issues and Process Documentation, and experiments by NGOs with alternative classification systems while attempting to organize and manage knowledge resources.

B. Comparisons with standard conventional ontology models like DDC and UDC, and evaluating manageability and utility aspects in the context of user-centric customized knowledge management towards long-term empowerment and social justice.

3. ALTERNATIVE CLASSIFICATION – WHY AND HOW ?

Why do we need alternative classification systems when there are already established standard Classification models like DDC, UDC, Thesaurus and Subject Headings Lists? There is also the question: do we *actually need* or do we prefer to use a scheme which makes our lives simpler..? This paper is supposed to address these issues. We are *not* trying to demean or ignore the value of established and universally popular Classification models like the DDC, UDC or Colon Classification. We are basically trying to look at other options.

3.1 The context and background

In the context of political and ideological developments of the 1970s and 1980s, we know that numerous rebel groups, Dalit groups, radical feminist and leftist groups brought different political insight and ideological understanding through campaigns, protests and organized movements, in order to bring about change in the society. At the same time, in order to support these movements and campaigns, small documentation centres, research and activist organizations emerged to document and disseminate specific information, challenge government actions, question neglected and discriminated areas and highlight issues otherwise unrecognized by mainstream media.

We have examples of women's organizations and feminist resource centres like *Akshara* and Vacha in Mumbai, Jagori in Delhi, Aalochana in Pune, Sanhita & Sanlaap in Kolkata, Sakhi in Trivandrum, Asmita in Hyderabad, Streelekha in Bangalore and issue-based campaign groups like Unnayan in Kolkata, Voluntary Health Association of India in Delhi, Chetna in Ahmendabad – to name just a few. These and similar groups were essentially geared to support the movements which led to their emergence and this implied both *information support for, and ideological agreement with the movement.* Hence the nature and functioning of such groups have been different from conventional libraries and documentation centers in every step of information organization and management.

3.2 Experiments with ontology models

It has been observed that conventional systems of documentation and resource classification are more suited to cover a wide variety of subjects with clear boundaries, but when it comes to cross-disciplinary themes and topics, they are of little or no help at all. Both the DDC and UDC have been found to be

i) Useful for defined and structured subjects like medicine, pure sciences, literature, social sciences, language, etc.

ii) They require a trained librarian to use the schemes.

iii) The resultant class numbers are long, cumbersome to write, remember and locate. Even a minor error in classifying or shelving would lead a document to be misplaced or displaced.

We will work on the comparative details later in the paper. Presently, we will focus on the two centers which developed ontology models for the development groups.

3.2.1 CED model of subject classification

The Centre for Education and Documentation (CED), Mumbai had its modest beginnings in 1975 with John D'Souza and others attempting to organize both specialized and general information on development issues and most importantly on the emergency and resistance to it. It developed its indigenous classification system in 1979, where the emphasis was on issues of civil liberties and human rights. The Classification system was revised in 1986. The notation is *alpha-numeric with two digits* and further sub-classification by means of lower case alphabets. In 1985, CED formed the network of Documentation Centers and shared its resources management systems with other documentation centers (http://www.doccentre.net/About/index.php). The idea was to work towards common systems of knowledge classification. By 1990, CED's classification systems became popular as an information hub for alternative material, among NGOs, activists, media persons and professionals.

3.2.2 Akshara Classification System (ACS)

The *Akshara* Classification System (ACS) was designed and developed essentially by two women Lakshmi Menon & Nandita Gandhi of AKSHARA CENTRE Mumbai, to attend to the documentation

needs of women's centres and other NGOs. It was revised first in 1990 and then again in 1994. Various development centres and activist groups in India have adopted the module entirely, while some have modified it to suit their specific needs.

The *Akshara* Classification System was developed with the following features:

- Inclusion of both general and women-oriented conceptual issues with a special emphasis on movements and alternative campaigns
- Suitable for oppressed groups and minorities. Sensitivity towards issues relevant in the context of our society and individual lives.
- Flexible and can be easily modified. Provides for future expansion.
- Easily accessible and user-friendly. Can accommodate 'gray literature' or unpublished materials with overlapping subject domains.
- Comes free of cost. Its use and understanding is not limited to librarians.

The latest version of *Akshara* Classification arranges all knowledge into 17 major classes. A letter of the alphabet is used to represent the main class and a three-digit notation is used to represent the sub-classes, thereby bringing out the hierarchy and/or the *relational context of the domain subject.* This model is characterized by *issue-based knowledge domains* with feminist *perspectives* of concepts and issues resulting from overlapping subject boundaries and facet linkages. There is no pronounced hierarchy between concepts under issue heads and the branching out is more relational than divisional. Each issue is a *Class* in itself, and the *perspectives represent various dimensions of the issues instead of hierarchical branches or divisions.* Here lies the uniqueness – a marked deviation from the Decimal system of knowledge hierarchy. But *facets within issues* are analyzed and *perspectives* treated as *classes of the facets.* These facets are essentially *issues* of research or action, campaigns, trainings and outreach.

How to use the Akshara Classification

First step: determine the thematic area (subject), its context or point of view and the form of treatment of that theme. Next step: two approaches (a) looking up the alphabetical subject index in case of time constraint, and (b) looking through main classes after determining the primary class and related sub-class.

For a reader searching for a document or trying to locate a document, it may be easy to look up the index. But for the Classifier or Librarian, it is advisable to go through the major Classes, and try to analyze the relationships of entities within each domain. Facet analysis is important when cross-referencing is required.

Both the CED and the *Akshara* Classification models are used to accommodate all kinds of resources – books, pamphlets, journal articles, audio-visuals, research papers and monographs, all types of campaign documents like posters, banners, charts, E-documents, etc. They can be used equally well for broad and in-depth classification. Libraries and Resource Centers of development groups have the choice of expanding on sub-classes within domains and doing away with some main Classes, depending on the research focus of the group in question.

3.2.3 Akshara *and CED models – with primary classes and notations*

Table1. ACS & CED with notations

AKSHARA CLASSIFICATION	CED CLASSIFICATION
ecology = A	gender, women & *society* = A
communications & *media* = C	government & administration = B
development & economy = D	services = C
education = E	*health* = D
health = H	*ecology* & environment = E
social movements = I	Indian economy = F
judiciary & law = J	Indian industry = G
culture & language = K	*labor* = H
labor = L	cities = J
organizations = O	agriculture = K
politics & *government* = P	*society* & *culture* = L
religion = R	history = M
society = S	*education* = N
technology & science = T	media = P
violence & crime = V	*development* & social change = Q
sexuality = X	Indian politics = R
other social sciences = Z	Indian states = S
	India's foreign affairs = T
	global economy = U
	geopolitics = W

3.2.4 Relationships within domains, common and overlapping domains

"Ecology", "Media", "Development", "Education", "Health", "Society", "Culture", "Labor" and "Government" are common in both the models. Let us look at the domain-relation architecture of *classes* and *issues* in both *Akshara* and CED models. (Fig.1)

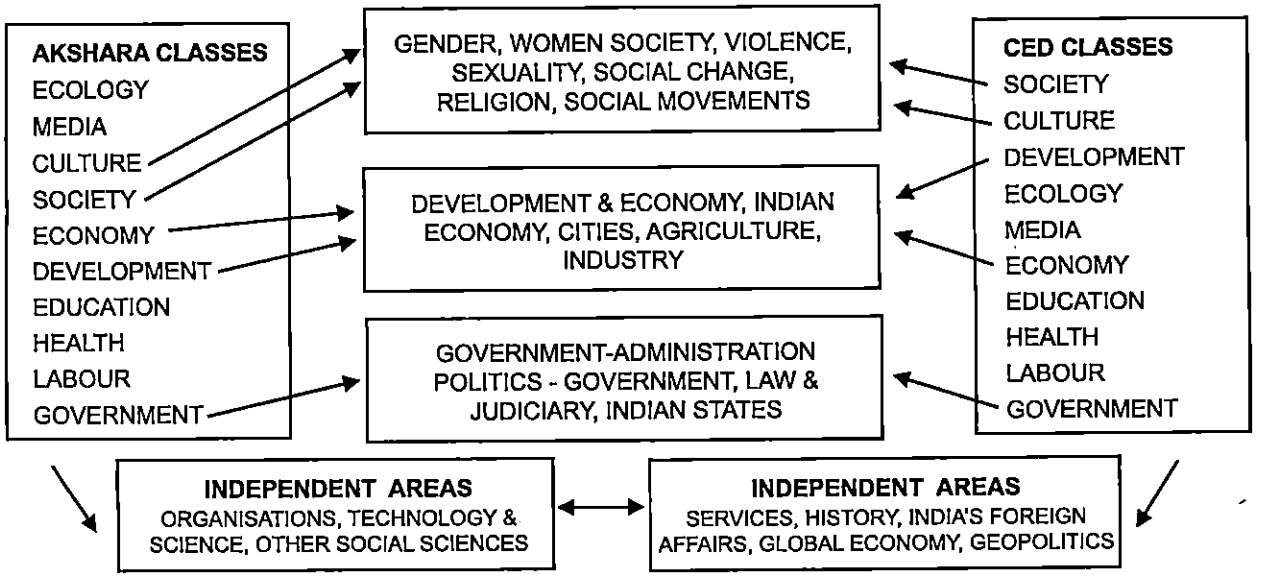


Fig 1. Domain links and relations

3.2.5 Unique features of both the models

a) Representation of alphabets for domains in *Akshara* is more logical and semantic, and hence easy to remember. For instance E stands for Education, H for Health, S for Society, R for Religion, V for Violence, etc

b) Five exclusive classes on India-specific issues in CED model – politically sensitized.

c) In *Akshara* model we find that domains and relationships within each domain are more issue-centric - more of socially sensitive issues (e.g. Social movements, Violence & crime, Sexuality, Religion) which relate directly to patriarchal social structures and gender constructs. CED model represents more of domains focusing governance (e.g. Services, Indian economy, Indian industry, Government & Administration, Agriculture, Indian States, Geopolitics, etc) related more to Political Sciences & Public Administration as we find in DDC or other standard universal models.

4. CASE STUDIES (NGOs adopting ACS or developing similar ontology)

We have some interesting examples of NGOs and Activist Groups which emerged out of a need for information activism towards empowerment of women. They believe that unequal access to information can lead to gender inequality and it is important to identify information needs of individuals and organizations involved in Gender & Development in order to disseminate relevant information in the right manner. They have adopted the *Akshara* model as a base for organizing their knowledge resources, but have also introduced variations determined by their ideological perspectives, research, activism and advocacy initiatives.

4.1 JAGORI

One is ***JAGORI, New Delhi*** (http://www.jagori.org) which undertook a massive re-invention of the Classification in 2005. Each major issue is an exclusive *Class* represented by a single alphabet. For example "A" is "Feminism", "D" is "Development", "G" is "Gender", "P" is "Protests and Movements", "V" is "Violence", "W" is "Women's Work" and so on. The perspectives or dimensions of issues are represented by numbers or digits or a combination of both – depending on the synthesis factor. For instance, under the "Law" section, we have Laws relating to Violence, Laws relating to Migration, Laws relating to Women's Rights, etc. Now, L95 is "Legislation on Trafficking" and L95a is "Trafficking Laws in India". At the same time, Violence, Migration, Women's Rights are also independent domains.

Cross referencing is considered important and documents often have alternative Class codes. For example, N20 is Migrant Rights, Migrant Laws under the main class "Migration and Trafficking", and we have a '*see reference*' with this as L92 which is "Migrant Women and Law" under "L" class. Similarly V51 is "Communalism, Communal violence" and we have a '*see reference*' to R21 which is "Religious Fundamentalism. Access to documents is more through descriptors or *keywords* constituting an integral part of the library database, unlike standard libraries where search is essentially through classification number or notation.

4.2 CHETNA

CHETNA (Centre for Health Education, Training and Nutrition Awareness), ***Ahmedabad*** (http://www.chetnaindia.org) has also adopted the *Akshara* system but being essentially focused on *Health & Development* issues, the major perspectives in organizing all resources have been "Women", "Adolescents", and "Children" - in relation/association to domains like Nutrition, Management,

Communication, Training, Education, Gender, Water and Sanitation, Primary Health, HIV/AIDS, Violence, Sexuality, Social issues, NGOs, etc.

4.3 SAKHI

SAKHI Women's Resource Centre, ***Trivandrum*** (http://sakhikerala.org) is a feminist library, documentation, training and resource center. Their thrust areas are Gender & Governance, Status of Women in Kerala, and Training & Capacity Building for women. They have adopted almost all the sections of *Akshara* but a minimized version with very few issues under the major domains. They prefer using *single alphabets only* for classification but their retrieval is guided more by the Accession numbers of documents. They have added one subject; "Adolescent Reference (AF)" because working with young people is an important program for them.

4.4 The Human Rights Law Network (HRLN)

The **Human Rights Law Network** (HRLN:http://hrln.org) is a collective of lawyers and social activists dedicated to the use of legal system to advance *human rights*, struggle against violations, and ensure access to justice for all. HRLN collaborates with social movements, human rights organizations, and grassroots development groups to enforce the rights of children, dalits, people with disabilities, farmers, HIV positive people, the homeless, indigenous peoples, prisoners, refugees, religious and sexual minorities, women, and workers, among others. The Socio-Legal Information Centre of HRLN has modified the *Akshara* model for classification. They have added "Children (C)", "Issues and Groups of Special Interests (G)", "Human Settlements (I)", "Globalisation (N)" and "Urbanisation (U)".

4.5 Tathapi Trust

Tathapi Trust, Pune (http://www.tathapi.org/akshara_classification.html) is a women's organization working on *health training and advocacy* from women's perspectives and tries to make resources on *health and women* accessible to local groups. They have adapted the *Akshara* model for organizing their materials on sexuality education and masculinity, gender and health, social history of health and medicine, community health, women's health status, violence and reproductive health. They have added categories like "Management", "Occupations", and "General Reference" for their classification.

We also have examples of *campaign-based organizations and groups* who have developed their own ontological structures with primary focus on *issues* or *dimensions within issue,* essentially deriving from multiple disciplines and overlapping subject fields.

4.6 Vikas Adhyan Kendra (VAK)

One such group is ***Vikas Adhyan Kendra*** *(VAK)* of ***Mumbai***. Their focal issues are Globalisation (A), Agrarian Situation (B), Dalits (C), Adivasis (D), Gender (E), Communalism (F), Children (G), Natural Resources (H), Health (I), Law & Human Rights (J), Politics (K), Economy (L), Peace (M), Culture (N), and Labour (O). Among these, "Gender", "Health", "Politics", "Economy", "Culture", "Labour" and "Law" are close to *Akshara* and CED models. The notation system consists of the single alphabet as the *main* issue followed by a numeral which denotes a *relation* or a *perspective or a dimension* of that issue. For e.g. Dalits is "C" and C2 represents Struggles & Atrocities related to Dalits. Gender is "E" and E6 stands for Employment issues in the context of Gender.

4.7 People's Union for Civil Liberties (PUCL)

The ***People's Union for Civil Liberties*** *(PUCL)*, ***Delhi*** (http://www.pucl.org) was formed to bring people belonging to various political parties on one platform. Some of the issues covered are:

Human Rights, Dalits, Minorities and Communalism, Judiciary, Police, Corruption, Poverty, Bonded Labour, Asylums & Rehabilitation Homes, etc. Without using ACS or CED, they have developed a unique ontology supported by subject index to aid in search & retrieval.

5. COMPARATIVE ASSESSMENT (alternative systems and standard models)

We will take up specific issues and topics which the above mentioned Centers have as their focus of research and activism, and see how they have been treated by standard models like the DDC or UDC. The main objective is to compare *notations* derived from the DDC or UDC with those from ACS or CED models and *domain relations* in both systems, in order to assess functional difficulties encountered during knowledge classification vis-à-vis the manageability aspects of search, access and retrieval.

While deriving DDC notations, we find too many instructions.."add to base number 305.4896, the numbers following 086 in 0862-0869 from Table 1"...The base number is already a long string, more additions on linking results in a longer string. Similarly in UDC, we get " -, :, ( )" etc. between notations as links and more cumbersome.

Table 2. Comparison of notation strings

Themes/Issues	DDC	*Akshara*	UDC	CED
Refugees	305.906914 (Social groups)	S 340/S 341/S 342 (Society,Migration)	314.151.3-054.73 (Migration+common auxiliaries of persons)	W46 (Geopolitics)
Prostitution	345.02534 (Criminal Law), 306.74 (Sociology)	Sex workers L 620 (Labour, special category workers)	2-447.8 (Religion, Social groups), 343.54 (criminal law), 176.5 (sexual ethics, traffic in women)	A56 (Gender, Women and Society)
Child abuse Culture)	362.76 (Social problems), 364.15554 (criminology), 345.025554 (criminal law), 306.874 (family relations)	V 320 (Violence & Crime), J 306 (Criminal Law)	053.2 (Child, common auxiliaries of person) and synthesis with Social Problems 364 Child sexual abuse 364.633:053.2	L22b (Society &
Human Rights	323 (Political Science, Civil rights) 361.614 (Social Welfare)	P 402/P 403/P 404 (Politics & Government)	342.7 (Public Law, Fundamental rights)	B8 (Government & Administration), A71e (women's rights as human rights)
Discrimination against women	305.42 (Women and society), discrimination at workplace 331.4133 (employment)	V 326 (Social & domestic violence), S 100 (Society) L 110 (Labour), H 840 (Discriminatory health practices)	316.647.82:055.2 (Social Psychology, Gender discrimination - synthesis with common auxiliaries of person)	A10a (Women & society), A51 (mental harassment), A70 (women's oppression)

A brief survey was conducted among *twenty five centers* who had deviated from traditional classification. Out of these, *sixteen* responded. Some major observations have been

- General preference for an alternative model to a conventional scheme like DDC or UDC. The primary rationale is *to avoid* lengthy and complex notations. Openness to faceted classification like the CC, but not comfortable with the process of *deriving notations*. Tendency towards a combination – adopting domains from the Colon Classification system (main classes and sub-classes) *but* assigning short and simple notations.
- Mostly women's centres and collectives involved in resource and idelogy sharing, prefer to use ACS (*Akshara*) for its feminist bias and sensitivity towards women's issues.
- Many times the decision on classification methodology depends on researchers or activists with ideological priorities. If the outcome is a non-standard ontology, the librarian (if there is one) has no option but to associate with the domains conceptually and functionally.

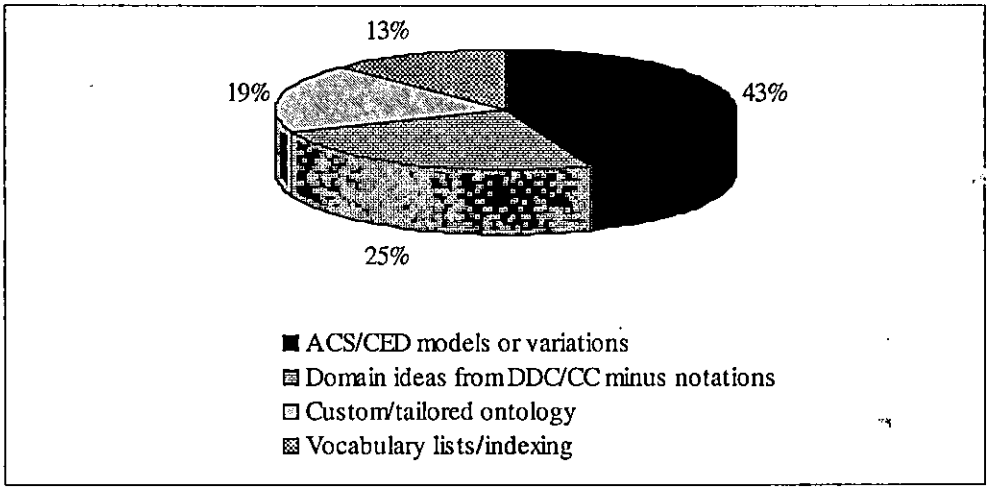


Fig. 2. Experiments with Alternative Classification (survey results)

The above diagram shows 43% used either ACS or CED models or their variations and 25% adopted subject domains from DDC or CC but developed simple alpha-numeric notations. While 19% claimed to have created customised ontologies (with a *letter in upper case* for the main class, a *numeral* for the sub-class and a *letter in lower case* for the metadata whereever applicable), 13% managed with vocabulary lists and keyword-indexing, with accession numbers determining physical location.

6. CONCLUSION

While reviewing the limitations of enumerative schemes, like DDC, we recognize the value of faceted schemes like the UDC or CC in enabling us to link/synthesize the facets to derive the notation. But the problem still persists... lengthy, cumbersome notations, difficult to write, remember or locate. Activists and development workers refuse to accept these notations as well as generic subjects and hence the task of the classifier becomes a major problem. On the other hand, a short and crisp notation derived by a *combination* of one or more letter/s (logically relating to the domain and phonetically

easy to remember) and a two/three digit string, is certainly more user-friendly and easy-to-manage in the context of accessibility, functional housekeeping and retrieval operations.

- It appears that the founders of both the ACS and CED models have not *followed up* with the NGOs using the schemes or have modified the schemes to suit their ideologies and actions. Some centers have even discontinued using these models and developed custom ontology models. There is no attempt to find out *why* they have done so.
- There is no common forum or a nodal group *to initiate a dialogue* between (i) knowledge managers representing groups, and/or (ii) between knowledge managers and researchers.
- There is *no documentation* on the problems and experiences faced by development groups while trying to decide on *best practices*, in the process of getting organized.
- Often we come across NGOs developing independent systems to link their research domains and manage their documentation. Either they are unaware of *already existing* models like *Akshara*, or they would have definite rationale for *not* using such schemes. Whatever the reality, this information is important and needs sharing through a group.

7. RECOMMENDATIONS

The development sector certainly needs hand-holding in organizing and managing knowledge. Non-profit groups with budget and other constraints should be able to look up to an umbrella organization who can possibly give directions and guidance. Information specialists and knowledge workers should collaborate with visionaries, social and political scientists, development activists and grassroots workers to develop best practices in knowledge management for the non-profit sector and those associated with this sector.

Neither the ACS nor the CED models are accessible through Internet. They should be uploaded and an e-group or a discussion platform be created to enable exchange of ideas.

Attempts to standardize the domains or major classes with their notations, should be initiated, so that resource centers can share common methods of knowledge management.

If we compare between DDC, UDC and CC we may find CC (Colon Classification) a relatively better answer to addressing the inter-disciplinary domains within ideological contexts and activism based knowledge. But if we can have a simpler and manageable version of CC with short notations, the small centers and grassroots groups with shoe-string budgets can have the best of both worlds - a standard established ontology (*not* having to think of spending on the Librarians' DDC), and also a solution to resource sharing.

ACKNOWLEDGEMENT

I am grateful to JAGORI Delhi for enabling me to conceptualize this research. My special thanks to Nita Shirali of *Akshara* Centre and John D'Souza of CED, Mumbai, Chetna Ahmedabad, Sanlaap Kolkata and Sakhi Trivandrum. I also thank the centres who spared their time and responded to the survey questionnaire. Above all, I am most grateful to the development workers, who initiated me into special classification and process documentation and into thinking 'beyond a librarian'. To handle a query from an activist is a big challenge!

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Ontological Semantic Mapping for the Subject Facets on Global Warming and Climate Change

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Abstract: To sustain the life and civilization on this planet 'Earth' day by day the term 'Global Warming' has become one of the most important sought heading. One unique affair of this phenomena 'Global Warming' is that here the concern and danger of the developed nations and developing nations remains the same, the economic and technological advantage of the developed nations can only show the light on further R & D on this topic and how we can combat this natural phenomena which may draw the last paragraph of our 21st century.

An effort has been made to collect the isolates or facets on the topic 'Global Warming and Climate Change' and arrange these facets into a semantic and ontological relationship and then transfer these facets into SKOS (Simple Knowledge Organization Systems) mapping and lastly translate this SKOS mapping into RDF (Resource Descriptive Framework) with the help of XML (Extensible Mark-up Language). Basically this is an Information System Tool, which can be applied on any subject/topic for accessing web literature. In this case this has been developed for accessing web literatures on 'Global Warming and Climatology'.

Keywords: SKOS, Semantic Web, RDF, XML, Metadata, World Wide Web (WWW), W3C, Ontology, OWL (Web Ontology Language)

1. INTRODUCTION

In this knowledge based society the growth of any subjects, specially in the areas of science and technology are much rapid and consequently the retrieval of this subject facets from the World Wide Web digital domain have become more complex and there are limitation between keeping balance between the recall value and precision ratios of the retrieved information. The topic like 'Global Warming and Climatology' is an extremely interdisciplinary nature of subject, and it has been observed that due its immense importance for last one decade, every year a lot of research papers have been loaded to the web for access, though some of them are in open access platform and majority are in the restricted domain tagged with yearly subscription criteria and to be accessed through IP registration formality. But like other multifaceted topics/subjects in the case of 'Global Warming and Climatology' also there are lacunas in the arrangement of metadata on the digital platform of the web literatures in a semantic and ontological relationship mapping in the WWW (World Wide Web).

The SKOS core mapping concept had been framed and developed by the W3C (World Wide Web Consortia) in 2005. The basic objective of the SKOS mapping is to fulfill the concept of Semantic Web Technology, where the metadata of the web literatures on any topic/subject will be arranged in a semantic as well as in an ontological relationship, so that when the general search engines like Google, Yahoo or Alta Vista will retrieve any information against a search query, the hits or the search results will be more precise and more inclined towards the subject core. The concept of semantic web is also a recent area of research, object of which is mainly to overcome the shortcomings of relevance in the web retrieval. We can say that semantic web is a mesh of concept linked up in such a way as to be easily processable by machines, on a global scale [Dumbill 2000]. However, semantic web technologies are still very much in their infancies, but specific researches are going on Ontologies, SKOS (Simple Knowledge Organization Systems), W3C etc. SKOS is an area of work developing specifications and standards to support the use of Knowledge Organization Systems (KOS), such as

Thesauri, Classification Schemes, Subject Heading Systems and Taxonomies within the framework of the Semantic Web.

2. SEMANTIC WEB – CONCEPTUAL APPROACH

Whatever may be the complexities of the semantic web research, one thing which the LIS (Library & Information Science) fraternity strongly feel is that there should be a relational mapping of facets of any subject with hierarchial relationship structure behind the web retrieval function, so that metadata which will link the data from the databases will get a structure of so called classaurus like matrix. It is strongly felt by the LIS people that what Dr. S R Ranganathan had recommended to analyze a subject facets and to organize those facets in a class index entries made long ago has become very relevant today in a semantic web environment.

3. SEMANTIC WEB TECHNOLOGIES

World Wide Web Consortium (W3C) has designed a set of web languages to express the meaning of the information resources on the web and each of these languages is the extension of the former:

- XML (Extensible Mark-up Language)
- XML Schema
- RDF (Resource Descriptive Framework)
- RDF Schema
- OWL (Web Ontology Language)

4. DEPENDENCE AND EXTENSION MODEL OF THE SEMANTIC WEB LANGUAGES

Extensible Mark-up Language (XML)/Schema ⟶ extended by ⟶ Resource Descriptive Framework (RDF)/Schema ⟶ extended by ⟶ Web Ontology Language (OWL)

5. SKOS (SIMPLE KNOWLEDGE ORGANIZATION SYSTEM) - KEY FEATURES

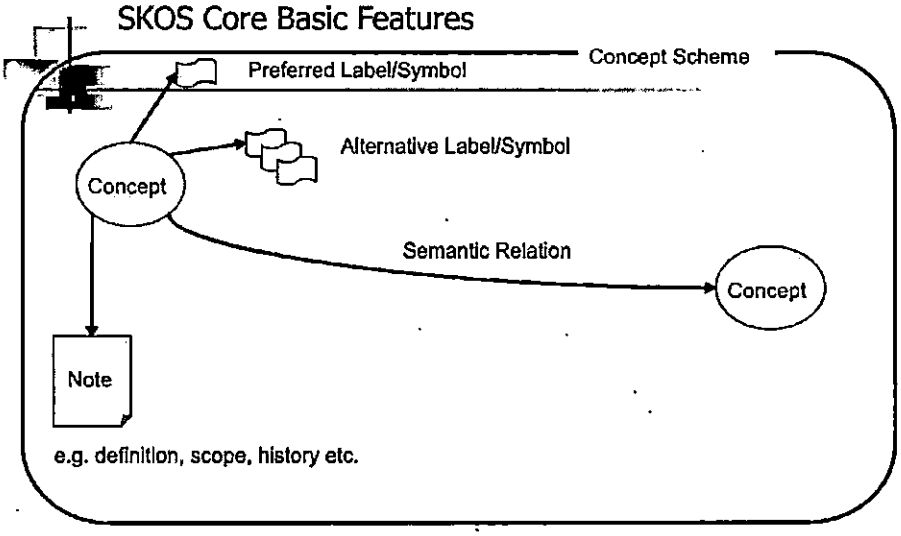
SKOS (Simple Knowledge Organization System) has three components:

- SKOS Core
- SKOS Mapping
- SKOS Extensions

Semantic Relationships:

- SKOS: Semantic Relation (Paradigmatic)
- SKOS Broader
- SKOS Narrower
- SKOS Related

6. SKOS CORE BASIC FEATURES



7. SKOS CORE ADVANCED FEATURES

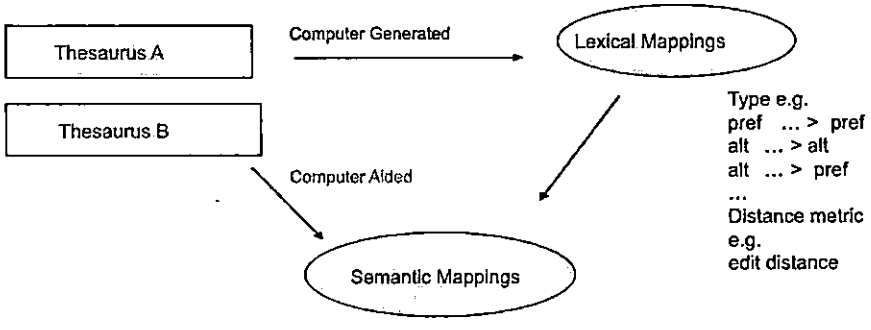
SKOS Core Advanced Features

- Extensibility ...
  - Create more specific properties as sub-properties of existing SKOS Core properties
- Custom Labelling Properties
  - E.g. Scientific/Household names ...
- Custom Semantic Relation Properties
  - E.g. BroaderGeneric, BroaderInstantive ...
  - E.g. PartOf ...
- ⇨ Can write specialised applications & still interoperate with generic applications

8. SKOS MAPPING VISION

SKOS Mapping Vision

- Add support for 'lexical mappings'...



9. FACETS/ISOLATES UNDER THE SUBJECT 'GLOBAL WARMING AND CLIMATOLOGY': THE FACETS/ISOLATES ARE ARRANGED IN A SEMANTIC ORDER

(Facets/Isolates are collected after consulting conventional print as well as web literatures like Books, Periodicals, Conference Proceedings and Handbooks deals with concepts like 'Global Warming' 'Greenhouse Effects' 'Climatology and Meteorology' 'Environmental Pollution' 'Ecology' etc)

BT (Broader Term)
Global Warming and Climatology
NT (Narrower Terms)
Anthropogenic Global Warming
(Human Induced Change)

BT (Broader Term)
Global Warming and Climatology [contd.]
NT (Narrower Terms)
Anthropogenic Greenhouse Gas
Atmospheric Greenhouse Gas Concentration
Average Global Surface Temperature
Clathrate Gun Hypotheses
Climate Change

NT (Narrower Terms)
Climate Model
Climate Model – Computational Grids
Climate Sensitivity
Climate Variability
Earth's Current Climate

Global Air Temperature – Earth Surface
Global Climate – Human Influence
Global Dimming
Global Temperature
Globally Average Temperature
Greenhouse Gases – Atmospheric Concentration
Greenhouse Gas Emission
Greenhouse Gas Levels
Interglacial Warm Period

BT (Broader Term)
Global Warming and Climatology [contd.]
NT (Narrower Terms)
Naturally occuring Greenhouse Gases –
Mean Warming Effects
Ozone Depletion
Per Capita Greenhouse Gas Emission
Per Country Greenhouse Gas Emission
Subtler Feedback Process
World Wide Sea Level Rise

RT (Related Terms)
Absolute Moisture Content
Agricultural Yields, Changes in
Shrinkage
Average Temperature
NT (Narrower Terms)
Average Temperature – Earth Near-Surface
Average Temperature – Ocean
Broad Agreement Amongst Climate Scientists
Carbon Dioxide
NT (Narrower Terms)
Carbon Dioxide – Atmospheric Lifetime
Cloud Condensation Nuclei

BT (Broader Term)
Global Warming and Climatology [contd.]
RT (Related Terms)
Clouds – Feedback Effects
Deforestation
Disease Vector, Increase in the Range of
Extreme Weather Events
Fossil Fuel Burning
Fossil Fuel Resources
Galactic Cosmic Rays
Glacial Retreat
Heat Capacity – Oceans
Ice-Albedo Feedback

Improved Energy Technology – Combat Climate Changes
Infrared Radiation – Atmospheric Gases
Kyoto Protocol
Lapse Rate Feedback
Lower Atmosphere – Long Range Radiation
Methane
NT (Narrower Terms)
Methane Clatharates
Natural Phenomena
NT (Narrower Terms)
BT (Broader Term)
Global Warming and Climate Change [contd.]
RT (Related Terms)
Natural Phenomena [contd.]
NT (Narrower Terms)
Natural Phenomena – Solar Variations
Natural Phenomena – Volcanoes
Naturally Occuring Gases
Northern Hemisphere
Ocean Heat capacity
Ocean Acidification
Ocean PH Factor
Ocean – Mesopelagic Zone
Orbital Forcing
(Scope Note: Variation in the Orbit around the Sun)
Ozone Layer
Paleo-climatology
Precipitation Pattern – Change of Intensity
Radiative Forces
NT (Narrower Terms)
Radiative Forces – CFC and Nitrous Oxides
Radiative Forces – Carbon Dioxide
Radiative Forces – Methane
Radiative Forces – Tropspheric Ozone
BT (Broader Term)
Global Warming and Climatology [contd.]
RT (Related Terms)
Rainfall Pattern

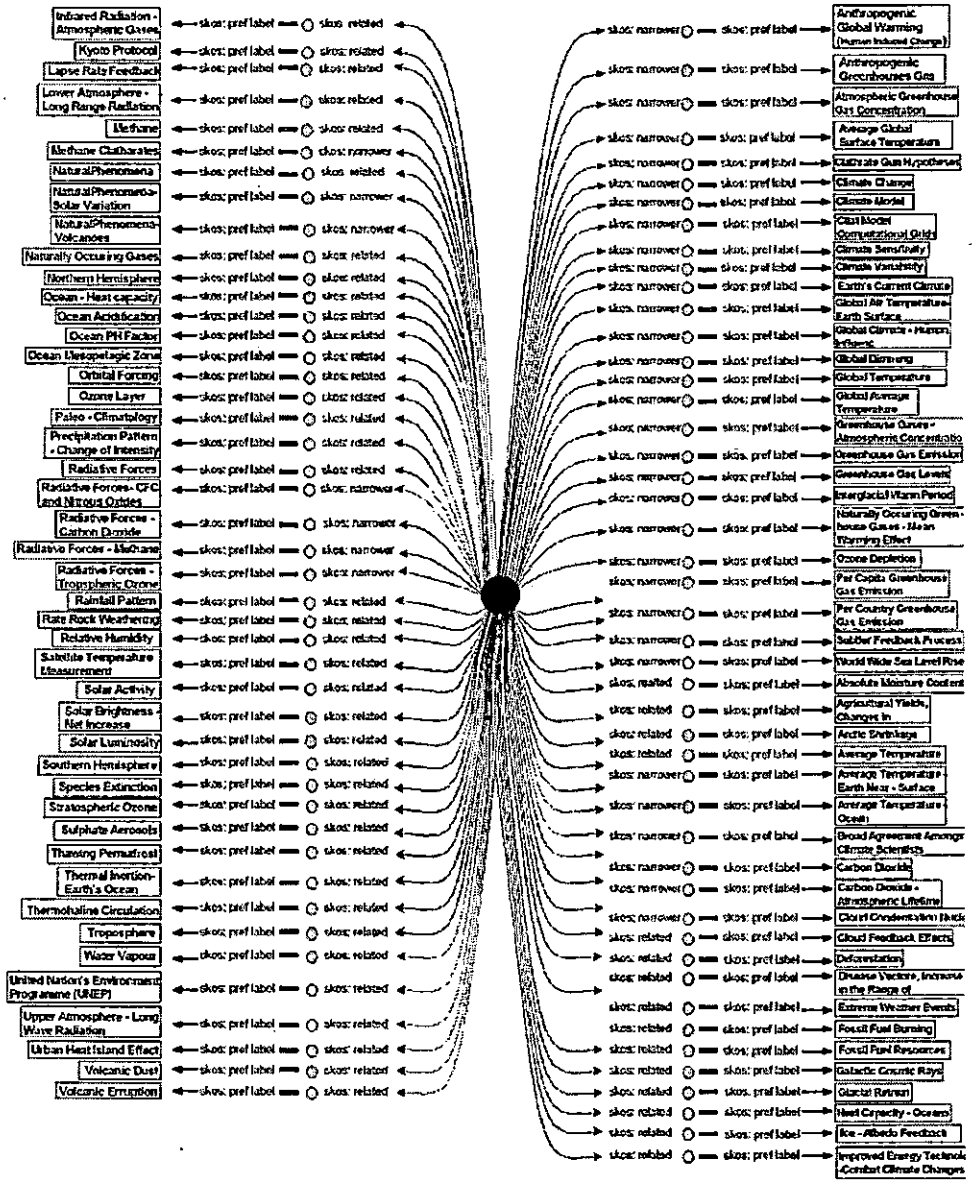
Rate Rock Weathering
Relative Humidity
Satellite Temperature Measurement
Solar Activity
Solar Brightness – Net Increase
Solar Luminosity
Southern Hemisphere
Species Extinction
Stratospheric Ozone
Sulphate Aerosols
Thawing Permafrost
Thermal Inertion – Earth's Ocean
Thermohaline Circulation
Troposphere
Water Vapour
United Nation's Environment Programme (UNEP)
Upper Atmosphere – Long Wave Radiation
Urban Heat Island Effects
Volcanic Dust

BT (Broader Term)
Global Warming and Climatology [contd.]
RT (Related Terms)
Volcanic Erruption

10. TRANSFERRING THE FACETS/ISOLATES INTO SKOS CORE SEMANTIC MAPPING – RDF GRAPH (STANDARD FOLLOWED – SKOS CORE GUIDE (HTTP://WWW.W3.ORG/TR/2005/WD-SWBP-SKOS-CORE-GUIDE-20051102)

SKOS core provides a model for expressing the basic structure and content of the concept schemes such as thesauri, classification schemes, subject heading lists, taxonomies, and other types of controlled vocabularies, and also the concept schemes embedded in glossaries and terminologies. SKOS core is an application of the Resource Description Framework (RDF). RDF provides a simple data formalism for talking about things, their properties, inter-relationships, and categories (Classes).RDF semantics for its formal mathematical basis, and RDF syntax for details of the RDF/XML documents format used to exchange RDF data. The SKOS core vocabulary is a set of RDF properties and RDFS classes, that can be used to express the content and structure of a concept scheme as a RDF graph.

Efforts have been made to transfer all those facets/isolates under global warming into RDF graph, where all those facets/isolates are being drawn into its relationships (i.e. broader/ narrower /related) with the generic term global warming. Another important point is that at the time of drawing the graph, the label of the terms or the labeling properties have been also enumerated, i.e whether it is a pref-label, alt-label or hidden label. There are mainly three types of SKOS labeling properties: skos:preflabel, skos:altlabel, skos:hiddenlabel. Here labeling means assigning some sort of token to a resource, where the token is intended to be used to denote (label) the resource in natural language discourse and/or in representations intended for human use.



SKOS Core Semantic Mapping of the Facets on Global Warming

Prefix skos:< http://www.w3.org/2004/02/skos/core#>

11. XML: RDF TRANSFORMATION OF THE SEMANTIC WEB RELATIONSHIP :FACETS OF THE SUB-CLASS -À GLOBAL WARMING (COPY OF THE XML:RDF PROGRAM FILE) STANDARD FOLLOWED: SKOS CORE GUIDE (W3C WORKING DRAFT – NOV., 2005) (HTTP://WWW.W3.ORG/TR/2005/WD-SWBP-SKOS-CORE-GUIDE20051102)

The Semantic Web combines the descriptive languages RDF (Resource Description Framework) and OWL (Web Ontology Language), with the data-centric, customizable XML (eXtensible Mark-up Language) to provide descriptions of the content of Web documents. These machine-interpretable descriptions allow more intelligent software systems to be written, automating the analysis and exploitation of web-based information.

Semantic Web Technologies:

- Provides a comprehensive exposition of the state-of-the art in Semantic Web research and key technologies.
- Explains the use of ontologies and metadata to achieve machine-interpretability.
- Describes methods for ontology learning and metadata generation.
- Discusses ontology management and evolution, covering ontology change detection and propagation, ontology dependency and mediation.

12. CONCLUSION

Though this semantic web concept is a very recent one, and researches are going on all over the world to enhance its efficiency as well as effectivity in handling the vocabularies. But, there is no doubt that the uncontrolled growth of web literatures specially in the domains of thrust areas of scientific and technological subjects, the semantic web is one of the options, where there may be a balance between the recall value and the precision ratios in context of the retrieval of the web literatures through general search engines. It is more meaningful for the specialized users of web literatures, as because with the help of semantic web technologies, searches can be possible to be confined within his/her own domain of interest.

As Global Warming is a multifaceted and interdisciplinary area of research, the interest domains of the users also multifarious, and ranges of specialized users varies from physicist, chemist, biologist, agriculturist to an economist also. That is why the semantic web mapping and SKOS labeling of facets for this sort of subject is much more complex, and needs more intensive researches of its metadata components and proper feedback mechanism of the functional semantic web models.

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Portal as a Tool for Knowledge Management Synchronization

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Abstract: This article deals with the definitions and different types of portals. The business models o portals are also discussed. The major functions of portals are described including the corporate portal as shared information work place and also discussed the behavioural-ecological approach to corporate portal design. It also deals with the knowledge management (KM) and KM systems. The four major categories under KMS are also explained with the KM strategy. The portal features are discussed with and as a tool to KM activities. Library portals are also discussed and it has been emphasized on knowledge processes of the support given by the portals. The Knowledge generation has been discussed under the storage process, distribution process and usage process. The main features of portals are enunciated with the effectiveness of portal: It has been concluded that portal has to be built as per the organizational goals and objectives and librarians should develop the necessary skills and competencies to develop the same to synchronize the KM activities through that.

Keywords: Knowledge management, Portals, Vortals, Information ecology, Librarians, Human capital.

1. INTRODUCTION

The portal has become the most powerful tool for the delivery of customized data to the end-user. It is the ultimate tool for adding value and it offers a single point of entry through a common interface with information, resources and business processes based on the end-user's needs and specifications. Portal development is a complex and costly endeavor that requires meticulous planning and design. This will be useful to the information professional who is contemplating portal development and it may be used as a model in developing a blueprint of the portal. It includes a general overview of portals and the specifics of defining a portal vision, the first component in a portal-definition document. It acts as a tool for knowledge management activities.

2. TYPES OF PORTALS

A portal is a central place for making all types of information accessible to an audience of varying range. It has been defined as a web site that provides the ability to use a secure username/password and to customize the content based on specific interests and needs. There are various ways of describing portals. Two commonly used terms are "horizontal" and "vertical".

a) A horizontal portal is a broad, general portal usually aimed at consumer audiences. It typically offers free e-mail, personal home pages, instant messengers, news, weather and more. MyYahoo! is an example of a horizontal portal.

b) A vertical portal (sometimes referred to as a "vortal") provides information and services related to a particular subject or industry. MyFlorida.com is an example of a vertical portal that provides user-customized information about Florida government.

Dias (2001) describes several types of portal based on function:

(1) Decision support

- information (organizes collections of information by subject);

- business (facilitates access to internal documents and information); and
- decision processing (provides value-added information on demand).

(2) Collaborative processing

- collaborative (provides groupware tools and work-flow systems); and
- expertise (facilitates access and connection to individuals based on expertise).

(3) Decision support and collaborative processing

- knowledge (is a combination of an information, collaborative, and expertise portal); and
- enterprise information (uses metadata and XML to integrate unstructured data to structured data through a personalized intranet interface).

A portal acts as a blueprint that outlines the overall structure of an institution and includes the following components: i) vision; ii) content-management strategy; iii) management framework; and iv) development and implementation strategies.

Portals come in three basic varieties, according to a study of portal business models by the University of Washington's School of Business:

- ***Horizontal portals*** like Google (Nasdaq: GOOG), Yahoo (Nasdaq: YHOO) , MSN and AOL provide gateway access to the Internet's vast store of content and services along with a broad range of tools for locating information and Web sites, communicating with others and developing online communities of interest. They make money through advertising and transaction fees from multiple vertical solutions channels.
- ***Vertical portals*** like WebFlyer and WebMD provide deep content, a place to conduct business, learn and shop, communities and community-building tools. These portals are often composed of a variety of business models, all of which generate separate revenue streams, including advertising and referral fees (if transactions are not completed online). Service fees and transaction fees may be generated if transactions are completed online, and subscription fees may also be generated for unique content.
- ***Affinity portals*** like iVillage.com (women) and Realtor.com (realtors) provide deep content, commerce and community features like those found in vertical portals, but these offerings are targeted toward a specific market segment or even a specific gender. The revenue model is similar to vertical portals, with cost and asset models based on the business model adopted by the portal.

3. FUNCTIONS OF A PORTAL

The portal is the tool that links the various silos of KM (internally and externally), in a meaningful way, into one unified source to facilitate policy making and decision making. "The portal is the interface, the place where information exchange and knowledge transfer takes place, but it is only one component of successful KM" (Cloete and Snyman, 2003). For example, the Corporate portals have the potential of providing organizations with a rich and complex *shared information work space* for the creation, exchange, retention, and reuse of knowledge. To elaborate this position, an information-based model of the corporate portal is presented in Fig. 1. The diagram illustrates three major components of a portal's shared information work space: a *content space* to facilitate information access and retrieval; a *communication space* to negotiate collective interpretations and shared meanings; and a *coordination space* to support cooperative work action. The provision of a shared information work

space may offer great benefit to organizations in that it can help organizational participants acquire, distribute, interpret, store, and retrieve information in their daily work practice (Detlor, 2000).

As an information content space, corporate portals can help organizations with improved information storage and retrieval. Due to their platform independent nature, portals can provide organizations with increased access to a wide variety of information sources, such as databases, legacy systems, and web servers, that reside both within and outside the company (Jones, 1999; Stackpole, 1999).

The ideas behind both Taylor's and Davenport's work add support for the need for a new approach to portal design if these systems are to facilitate and enhance organizational information access and use. Together, they stress the need to place less emphasis on information technology and content concerns and more awareness on how people behave with information in their typical work practice and settings. As such, Taylor's and Davenport's ideas can be used as a theoretical basis for the development of a new *Behavioural-Ecological framework* for the design and evaluation of corporate portals. Fig. 2 illustrates the workings of the Behavioural/ Ecological model, which consists of three nested layers: the information ecology of the organization, the information behaviours of users, and the value-added processes within a portal.

The *information ecology* refers to the internal information environment of an organization. It comprises many interdependent social and cultural subsystems that can influence the creation, flow, and use of information. Corporate portal goals refer to the ways in which portals help organizations accomplish their missions. Information management plans are the formal policies and standards an organization establishes to structure and control the management of its information resources and services.

Information culture incorporates the attitudes and norms organizational participants hold regarding issues such as the ownership and sharing of information, and the amount and intensity of information gathering and analysis appropriate or expected in an organization. Information politics refer to the political barriers in an organization which obstruct the movement of information across departmental boundaries and lead to the unproductive hiding and hoarding of information.

4. KNOWLEDGE MANAGEMENT

Knowledge can be viewed from several perspectives like i) finance and economy; ii) social and organization iii) human; iv) technical; or v) legal. In a company there are two types of knowledge exists viz. Company knowledge and corporate knowledge. Company knowledge refers to technical knowledge (explicit knowledge – characterizing the ability to design, build, sell and support products & services) used inside the company, its business units, departments, and subsidiaries. The tacit knowledge, i.e. the individual and collective skills that characterize the ability to act in accordance with circumstances and to make progress when stored in cabinets, people's minds, etc, the knowledge consists of intangible components. The management at a corporate level uses corporate knowledge.

5. KNOWLEDGE MANAGEMENT SYSTEMS (KMS)

Knowledge and expertise existing in organizations generate more value when they are rapidly applied, emphasizing mainly the role of transfer. It is of limited value if it is not shared. Therefore, companies are beginning to implement information systems designed specifically to facilitate the generation,

integration, sharing and dissemination of organizational knowledge. Such systems are referred to as KMS and fall into four categories (Ruggles, 1997; Wensley, 2000):

1. Content management tools: Tools that offer abilities to integrate, classify, and codify knowledge from various sources.
2. Knowledge sharing tools: Tools that support sharing knowledge between people or other agents.
3. Knowledge search and retrieval systems: Systems that enable search and retrieval and have some knowledge discovery abilities.
4. General KMS: Systems that propose an overall solution for a company's knowledge management needs.

Among these general KMS, corporate portals seem to present the potential of providing organizations with a rich and complex shared information workspace for the creation, exchange, retention and reuse of knowledge.

6. PORTAL AS A TOOL

Portals enable e-business by providing a unified application access, information management and knowledge management both within enterprises, and between enterprises and their trading partners, channel partner and customers (Gartner Group, 1998). A portal can be viewed as a way to access disseminated information within a company since information chunks can be stored in various systems using different formats. It is usually tailored according to the users' need and consequently, a single point of access to Internet resources, an integration platform focusing on unification oriented towards the business processes of the company. Therefore, portals synchronize knowledge and applications, creating a single view into the organization's intellectual capital. Portals have seen an evolutionary approach, the first ones were search engines, that evolved by integrating a variety of services such as virtual communities, real time chat, e.g. Yahoo.

Portals need to be implemented within a comprehensive KM strategy. Briggs (2000) says "a comprehensive KM strategy is the foundation – and the purpose – for a successful portal." Portals act as an interface for information exchange and knowledge transfer takes place in it. The potential of portal can be enhanced if it is seen to be an enabler of intellectual or Knowledge capital management, which is directly linked to the ultimate profitability, or increased effectiveness of an organization. KM facilitates the creation, capturing, organization, accessing and use of an enterprise's knowledge capital consisting of i) human capital ii) structured capital and iii) relational capital. Portal links the different silos of knowledge capital with each other as well as with the value propositions and organizational culture. The portal facilitates human capital creation by consolidating, integrating, enhancing and connecting to the knowledge people have within an organization. It enables structural capital to be shared, used, re-used, acquired, retained, identified, retrieved, transmitted, applied and networked within an organization. The portal facilitates, collaborates, updates, explores, interacts and promotes the image and the brand to customers, partners and interested parties (relational capital). An organisational culture should be created in which the portal is used. For this reason the portal strategy cannot be stand-alone, it must be incorporated into the organizational strategy for knowledge capital management (Temkin,2001).

7. PORTAL FEATURES

A Portal's features can be classified into three categories: 1) Core capabilities, 2) Supportive capabilities and 3) Web services.

7.1. Core capabilities

The tools that support the knowledge development phases and consist of:

i. Taxonomy - benefits include search, support, navigation, data control/mining, schema management, and personalization/information delivery.

ii. Publishing - supports content creation, authorization, inclusion and includes the ability to render or publish documents in alternate formats including HTML, PDF, XML, etc. in portal content collections.

iii. Search – the documents created by employees, partners, customers and competitors are often the most important information available to the organization that remains in general dispersed in numerous places. For these reasons an integrated search capability across multiple information repositories is essential.

iv. Personalization. Consists not only on the ability for users to modify their own interfaces and specify their preferences, but also the ability of the system to use such information to dynamically deliver specific content to users in order to propose to them the most relevant information to perform their job. Personalization includes both push and pulls technologies.

v. Integration. The ability to present a unified view of corporate information that integrates information from different organizational repositories instead of having corporate information spread across many sources within the organization.

vi. Collaboration. Corporate portals can also give organizational participants the ability to create a shared community because they present a natural forum for online collaboration by assembling a set of content and services to which members of a group have special accesses. Collaboration can also entail offering native portal services such as threaded conversation, project management tools such as task lists, calendars, document sharing or instant messaging.

7.2. Supportive capabilities

Tools necessary for the well-functioning of the corporate portal and consist of: security, profiling and scalability.

i. Security. The ability to secure access to diverse range of resources with incompatible security controls is an enormous challenge for corporate portals.

ii. Profiling. A technique aimed at sending personalized information to the user depending on his profile. Two techniques can be used: explicit profile based on the expressed preferences of the user or implicit profile based on data obtained from the human resources.

iii. Scalability. The ease with which the system can expand to support an increasing number of users or can be modified to fit the problem area.

7.3. Web services

A wide range of services that the firm can provide to users ranging from analyses, news to an e-marketplace where a company offers employees discounts on products and services that it has negotiated with vendors.

8. LIBRARY PORTALS

Librarians have long sought to select, evaluate, and organize information on the Internet. Efforts began with individual librarians sharing bookmark files of favorite sites and progressed to increasingly large, collaboratively produced general and subject / discipline-specific gateway websites or megasites. Megasites list major resources usually in a particular subject area or discipline. A library Web portal has the potential of changing librarian's activity towards their work, professional and organizational culture. These changes will enable libraries to be customer centered. Systems and processes will be based on dynamically linked and scalable databases that will enable library staff to concentrate on content delivery and teaching. These trends will inevitably enhance the academic library's ability to deliver on its major strategic goal-delivering positive learning outcomes to customers and stakeholders. However, the library Web portal will not bring these benefits to the library organization and institution without overcoming certain obstacles, including certain forces within the organizational culture that will resist changes in this direction. They now provide increasingly complex and sophisticated browse and search capabilities with a multitude of access points, often including call numbers and subject headings. Increased collaboration among portals; automated location, selection, and cataloging of resources; integration of multiple resource types; and increased access to full-content and virtual library services will be the future trend in portals.

9. PORTALS SUPPORT FOR KNOWLEDGE PROCESSES

The most important functionality of portals is their ability to synchronize and support knowledge development phases. If it is built correctly and if it holds the promise of being the brain of the organization that can equip employees with all the knowledge and vital information required to successfully perform their engagements. The portal tools should be viewed as the mechanisms to augment and interconnect resources so that information can be distributed, consonant with the organization's requirement for individual and team-based management, and responsiveness to change, etc.

10. KNOWLEDGE GENERATION

Knowledge generation requires tools that enable the acquisition, synthesis, and creation of knowledge. The following three components of portal features support the knowledge generation process.

10.1 Storage process

The organization should classify the filtered knowledge and add it to the organizational memory. The stored knowledge in manuals, databases, case studies, reports and even corporate processes and rules of thumb makes up one column of the core activities. The other columns consist of the knowledge stored in the brains of thousands of employees who leave their respective organizations at the end of each working day. Corporate portal includes many components supporting the storage process.

10.2 Distribution process

To what extent a firm succeeds in distributing knowledge depends on organizational culture and the amount of explicit knowledge available in the firm. Corporate portal includes many components

supporting the distribution process like profiling, push / pull technology & publishing documents in different formats.

10.3 Usage process

In the application stage, the organization's knowledge worker should use the retrieved knowledge in performing tasks such as: solving problems, making decisions, researching ideas, and learning. The application of knowledge is the most essential task of knowledge management.

In general, portal includes many components that facilitate the knowledge usage process like integration, process automation and life cycle management. However, companies are not exploiting the full potential of the technology they already possess. The main features of the portal are (Barthes, 2002):

- Access to e-mail (main interaction mechanism);
- Possibility to create documents (mails, personal, project, public);
- Task management with notification (milestones, subtasks);
- Directories (personal, project, general);
- Calendars (personal, project);
- Subscriptions (to documents, web searches)
- Favorite references;
- Workflow;
- Discussions.(Benbya)

11. PORTAL EFFECTIVENESS

The work of Mohamed et al. (2006), for the use of portal, it should adopt four dimensions of the information system effectiveness model:

- service quality;
- systems quality;
- information quality; and
- user satisfaction.

Thus, information quality is defined as a function of the value of the output produced by a system as perceived by the user. Measures associated with information quality include content variety, complete information, detailed information, accurate information, timely information, reliable information, and appropriate format. Systems quality is the measure of the portal itself and focuses on the outcome of the interaction between the user and the portal system.

12. CONCLUSION

Portals seem to present the potential of providing organizations with a rich and complex shared information workspace for the generation, exchange, and use of knowledge. They synchronize knowledge and applications, creating a single view into the organization's intellectual capital. But developing corporate portals and building the critical mass of users required to make them successful is not an easy task. Given the risk that corporate portals fail to deliver the expected benefits, an important task for knowledge management research is to contribute knowledge that will support

researchers and practitioners in their efforts to successfully develop and implement corporate portals. Academic librarians should bring unique perspectives and skills to the development of portals in their colleges and universities (Zemon, 2001). It may bring their expertise with content, their knowledge of copyright, their commitment to customer service and their experience in creating customized web-based information delivery systems.

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National Knowledge Commission (NKC) and the Development of Library Sector: An Objective Assessment of the Proposals

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Abstract: The National Knowledge Commission (NKC) has included the Libraries as one of the concepts of knowledge paradigm. A Working Group on Libraries (WG) was set up to review the sector, resulting from the deliberations the WG has made several recommendations to the NKC to be forwarded to the Government for implementation. The paper attempts to review the recommendations and assign some amendments to some of them. The recommendations, the paper feels should have long term vision and task of WG should have culminated with a recommendation of formulating the National Information Policy. Authors' opinion is that a well drafted policy document would have been a good augury to the sustained development of the library sector.

Keywords: National Knowledge Commission (NKC), National Information Policy, Information Literacy, Knowledge Society.

1. INTRODUCTION

It is now well known amongst all concerned that for the first time National Knowledge Commission (NKC) has been set up under the directions from the Prime Minister of India to profile "the ability of a nation to use and create knowledge capital and empower and enable its citizens by increasing human capabilities". It further emphasizes "to respond to global challenges more strongly than ever before, as the country needs a knowledge-oriented paradigm of development to give the country a competitive advantage in all fields of knowledge". The NKC has identified "five aspects of the Knowledge Paradigm", they are; "Access to knowledge, knowledge concepts, creation of knowledge, knowledge applications, delivery of services". It is befittingly appropriate that the NKC has identified Library Sector of the nation as one aspect of the five knowledge paradigms, under the "Access to Knowledge". The NKC created a Working Group on Libraries (WG) "with a prime objective to examine the present standards and services of Libraries – public, private, institutional and specialized – and other information centres and resources – to create mechanisms and institutions that will serve the people. The goal is to transform libraries from guarded storehouses of publications into open stockpiles of knowledge". It is a welcome move, yet it has several implicitly unanswered questions, contemporarily faced by the library fraternity. The NKC has submitted so far two Annual Reports – in 2006 and 2007 since its constituting in October 2005. In concurrence with the NKC directive the WG on Libraries also placed several proposals in the form of recommendations for consideration. An attempt is made in this paper to reassess the proposals and offer some modifications if feasible to include them in the next phase of submission. It is important to mention at this juncture all the libraries in general and the public libraries in particular should be viewed as important elements of the foundation of knowledge "society", against the knowledge economy. Since the Libraries come under the non-profit oriented system organizations, and in comparison to only the R and D, business and industrial sectors entitled to create business intelligence and knowledge, hence they are the part of the knowledge economy per se.

2. ON WORKING GROUP TASKS AND PRIORITIES

The task of the working group is spelt in its "terms of reference flagging nine priorities". The priorities are too general and lack in-depth study of past reviews and reports. For instance, the need for "redefining the Country's Library and Information Services sector" seems superfluous, as the study of aims and objectives of Library and Information Services is inherent with the Library concept. The impact of other disciplines has always been a welcome process, and the objectives of the libraries have concurrently adapted to new environment without drastic changes in its prime objective. That is to state, providing access to knowledge is the fundamental work of the Libraries since the ages. Only the changes in the format of documents and influence of the contemporary technologies on search and access have changed, where the libraries have adapted to this change – from Card Catalogue to OPAC or Databases. The libraries basically are involved in this function and there no need to redefine this objective. The priorities lack vision and focus should have been on the present and future developments in the field and their impact on services, systems, and personnel. The terms of reference should have included a proposal on formulation of "National Information Policy" for instance, which is being on the national agenda since mid-1970s and that would have taken care of many of the tasks of the development of library and information sector. Further, the commission would have suggested to the WG on Libraries to come out with a White Paper on Libraries, so that the strengths and weaknesses of the sector would have been highlighted appropriately.

Many commission and committee report on the development of Libraries in the country are available today. Takur (3) has enumerated the earlier efforts in this regard starting with Sinha Committee (1957) and the Sadler Committee reports on Libraries and Education respectively. Since the Sadler report, the emphasis on Libraries has retreated gradually and the New Education Policy of 1986 has made a scant mention to the Libraries in the education sector, compared to either Radhakrishnan or Kothari Commission Reports. The NKC has appropriately taken up the overhaul of education sector too, and the development of School libraries should have been on the priority list as the "Library Culture" and Library and Information Literacy" has to be inculcated at the School Education level. Dr. Ranganathan had emphasized "Library Centred Education" as it ensures establishment of well equipped school libraries. This should be on the priority list both NKC and WG. The status of the school libraries in the country, excepting in few privileged organizations, is of total neglect and given least importance. A suggestion on School Library Legislation, on the lines of Public Library Legislation was made by Dr. A.C. Devegouda, a former DPI of Karnataka. The WG would have taken into serious consideration the efforts of Dr. Ranganathan, on school libraries, public library acts and other contributions of him which have no time frame of applications as they contain one of most futuristic vision of development of libraries in India. The background work on NISSAT programme (4) provides a reckonable quantum of data useful for the work in Library and Information System developments in the country.

Some documents on the development of Library and Information Systems in other countries are quoted here. The establishment of British Library, in 1973, has resulted from the two known reports - by Lord F.S. Dainton (5) and Thomas Parry (6) generated in 1969 and 1967 respectively. These two scholarly reports directly contributed to the development of a National Library System, encompassing all types of Libraries. The Dainton Committee Report was followed with a White Paper on Libraries presented in the UK Parliament that saw the passing of British Library Act in 1972. The suggested changes in the Report were very revolutionary, as many libraries under different authorities were brought under a single apex body. The National Central Library established in 1916, the National Reference Library on Science and Invention, National Lending Library for Science and Technology,

were amalgamated and merged to form British Library Document Supply Centre and the Library of British Museum under the British Library Board.

Another example is that of US. The drafting of US National Library Policy was proposed in 1966, the outcome of which was Law by President of USA. The Law provided Library and Information Services to whole nation and establishment of National Commission on Library and Information Science (NCLIS). The establishment of the NCLIS was passed in the Congress in its 91st Meeting in 1969 and converted as PL-91-345 on 20th July 1970. The entire Library and Information service provider facilities today rest with Federal Government. The NLM, NTIS, NSF (OSIS), ERIC, the Library of Congress, NASA. US Dept. of the Interior, National Agricultural Library, National Bureau of Standards, Defense Documentation Centre and others are now part of the Government Departments. The Weinberg and SATCOM Reports (7,8) on the provision and access to scientific and technical information, which is considered as the wealth of the nation have created a lasting impact on these developments The Clearinghouse for Technical Reports, created under US Department of Commerce, named as NTIS is an excellent organizational set-up for providing access to entire Report Literature under a single roof.

The contributions of the National Associations in this context are also noteworthy. Two publications, A Review by the Library and Information Council (9) and that of the Special Libraries Association (10) in US highlight the professional needs vis a vis the Professional education in the 21st Century.

In the perspectives of this background the WG would have taken notes from these well known documents to draft suitable recommendations taking into consideration the needs of the emerging knowledge society. It can be stated here that since the NISSAT Programme, no major effort has been taken up to develop the Library and Information Systems in India, and none of the recommendations of the previous committees have been implemented in full complement. It is now an opportunity that the NKC has given a task to the profession to take to the new paradigm change, bearing this in mind the paper has suggested some amendments to the Recommendations of the WG on Libraries. At first the paper enlists the recommendations made to NKC and then suggests amendments.

3. NKC AND WG DOCUMENTS CONSULTED

Since the NKC set up in 2005 the under mentioned documents are generated from the deliberations of the meetings of the NKC and the WG on Libraries. They are consulted and studied to offer the intended suggestions.

1. National Knowledge Commission – Report to the Nation 2006 and 2007.
2. Libraries Gateways to the knowledge: Roadmap for revitalization. A brochure brought out by the WG 2007.
3. Report of the WG on Libraries. This consists of the detailed categorized recommendations (29 in number).
4. Executive Summary of the Workshop Results emerged from the "International Seminar "Libraries on the Agenda" March 13-14 2008. Organized by Max Muller Bhavan, New Delhi in collaboration with British Council, French Embassy, Instituto Cervantes and supported by the National Knowledge Commission.

5. Comments offered by the LIS professionals and other stake holders posted to the website of NKC on NKC/WG Recommendations There are 37 responses sent to the Discussion Board of the NKC Website.

4. AN OVERVIEW OF RECOMMENDATIONS

NKC has included the Libraries under Access to knowledge, considering them as potential systems in providing access to knowledge and facilitate its use through various library services and systems, with wide variety of dissemination channels. The NKC, "Recognising that Library and Information Services sector needs immediate and sustained attention in order to fulfill its potential, set up the WG on Libraries composed of experts in the area. The WG made 29 Recommendations which are categorized under following heads.

1. LIS Policy: Important recommendations under this are related to ;

a) Libraries to be included in the Concurrent List of the Constitution of India.

b) National Commission on Libraries

c) National Census of all libraries and survey of User needs and reading habits, include them also in National Sample Survey.

d) Establishment of Indian Institute of Library and Information Science.

2. Finance: Important recommendation in this context is inclusion of Library budget as part of the Central and State Education budgets.

3. Library Charter. The recommendations in this category are;

a) Framing a Library Charter

b) Collection development

c) Expected services and facilities of all types of Libraries

d) Periodic monitoring and evaluation of services.

e) Special Services to the visually and hearing impaired

f) Reference Service and use of ICT

g) Building local collection and its sustained development

h) Integrated development of all types of Libraries.

4. Access and Networking: It includes-

a) Computerised bibliographic records preferably in the form of a Union Catalogue and National Repository of Bibliographic Records.

b) Networking of Public Libraries

c) LIS Software.

5. Private Collection

6. Digitisation and Open Access; Digitisation of periodicals and news papers on priority and open access to research papers and projects.

7. Staffing Pattern

8. Public Private Partnership.

The document containing recommendations is supported with tables giving details of types of materials available and services provided by five different types of libraries. The appendices give the more details on some of the specific recommendations. For example the Appendix 2 on the setting up of National Commission on Libraries, Appendix 3 on the establishment of Indian Institute of Library and Information Science and so on.

Yet another set of identical recommendations from the document "Libraries – gateways to knowledge" states the Commission has made the following recommendations to ensure attention in development of libraries.

1. Set up National Commission Libraries
2. Prepare a National Census of all libraries
3. Revamp Library and Information Science Education, training and research facilities.
4. Reassess staffing pattern of libraries
5. Set up a central library fund
6. Modernizing Library Management
7. Encourage greater community participation in library management.
8. Promote ICT application in libraries
9. Facilitate donation and maintenance of private collection.
10. Encourage Public-Private Partnership in developing of library and information services.

The above ten recommendations have five Annexure, pertaining to the items, 1,3,4,6 and 10.

5. THE PREROGATIVES

At the outset this paper sets some prerogatives, in consonance with the role of the NKC and the needs of the hour. Most recommendations looks to be too general and arbitrary, The WG should have basically suggested for the National Information Policy and also would have shouldered the responsibility of drafting and getting it approved. This should have also taken into purview the IT Act and other related issues, the IPR and RTI. The need for Information policy for the country was on the agenda since 1975, as information was considered as a core sector in the Fourth Five Year plan. Yet information, as Arunachalm (11) has put it "information is one of the neglected dimension of science of India". The Weinberg report and the other documents referred earlier have stressed on the Information or the content, as the core for facilitating the use of the technology. For the entire world of scientific literature or Information, the said reports have given the prime place for it, hence nearly 80% of this literature gets generated only from few countries namely, USA, UK and from some European nations.

There should have been a specific recommendation on the National Library of India, which is the custodian of our nation's knowledge wealth. Along with this the Bibliographic Control of published and unpublished sources of information seriously lacks in our country. Without this work to envisage building Union Catalogues would be distant dream. The National Library and the State Central Libraries should be actively engaged in the Bibliographic Control of all publications under their respective domains. Most of the State Library Acts contain clauses on Bibliographic and technical services. In Karnataka, the University of Mysore has shouldered the work of Bibliographic Control of Kannada Books since last few decades with additional grants from the University. The State Library Authority should consider this as its responsibility as it is the legal depository of all publications

generated in Karnataka. In this way the compilation of State Bibliography should be undertaken by the state library as it is in the provisions of the Karnataka State Public Libraries Act 1965.

6. AMENDMENTS AND SUGGESTIONS TO PROPOSALS

In addition to the above, some amendments and affirmative actions are suggested to the recommendations made by the WG one by one from the of WG on Libraries Brochure.

1. Set up National Commission Libraries.

2. Prepare a National Census of all libraries

As already suggested this will be part of National Information Policy. The National Information Policy will not confine to any time frame, as suggested for the National Mission.

3. Revamp Library and Information Science Education, training and research facilities.

The WG has suggested for setting up Indian Institute of Library and Information Science. It is not a welcome recommendation. There are already three national level Institutions offering high-level education and training in LIS in addition to nearly 100 LIS Departments in the Universities, offering courses from Certificate to Doctorate Degree programmes. The national level Institutions are, DRTC (Under ISI), NISCAIR(formerly INSDOC under CSIR), and the NCSI (under IISc, Bangalore). It is appropriate that these and some of the best performing University Departments of LIS be developed and upgraded to the national Institution level as Recommended. In addition, the UGC also offers incentives to the selected Departments by SAP, to develop them. In the place of setting up an independent Institute, it is desirable to consider setting up "Council for Research in Library and Information Science" as suggested by Asundi and Gunjal (12). Similar views were also expressed by Kamaiah (13).

4. Reassess staffing pattern of libraries

The staffing pattern and some of the grades and suggested positions seem to be redundant as there are independent statutory bodies like UGC, AICTE, CSIR and the Government Departments to decide on the cadre and recruitment of library staff including the salary scales. The staffing pattern suggested by the WG has been in vogue, and the UGC and other similar bodies have worked out the staff strength based on the teaching and administrative work loads as the case may be. It may be brought to the notice of all concerned that Dr. Ranganathan worked out detailed **Staff Formula** for libraries and in one of the UGC Reports Chaired by him he had suggested Teaching staff for LIS Departments. Ranganthan's staff formula can be taken as basis for working staffing patterns for the newer conditions based on the other practices available.

5. Set up a central library fund

It may be recalled that the Radhakrishnan and Kothari Commission Reports had made the suggestions in this regard. Similar views are also expressed in terms of R and D expenditure and the Government has not given any serious thought towards this since decades. As far as the funding of public libraries are concerned, the respective State Library Legislations take care of raising the funds for the Libraries. Since the levy of Library Cess is provided in every Public Library Act (and it should be) the fund for the purchase of library materials is borne from this, and the salaries and other administrative expenditures of the Public Libraries is borne from the consolidated funds of the respective state governments. The public libraries throughout the country also received sizeable grants

from RRLF and the state government also make matching grants. The public libraries therefore should set-up a mechanism to create reserve funds from their income through Library Cess and from the membership deposits they receive.

6. Modernizing Library Management

7. Promote ICT application in libraries

This head includes the recommendations on Library Charter, Collection Development, Services, monitoring and evaluation and the Networking of Libraries. The kind of modernization aspects detailed under this are some routine administrative and professional functions. Library Charter falls primarily under the public libraries area. The content of the Library charter are also very ordinary. In this context, the **Buckinghamshire County Library, Library Service Customer Charter** (14) is a best example of a Library Charter. What aspects of modernization are considered has to be spelt explicitly. The Networking of libraries, is now a routine ICT application, and is a process in the modernization. The item 8 to 'promote ICT application in libraries" is a recommendation that also goes with modernization. If some aspect of modernization has to be part of Library Management, the authors feel it could be adoption of e-governance, by which online acquisition processing, online meeting through chat and other similar facilities for the faster communication can be considered. The use of ICT in libraries is sine qua non today as the users are now getting well acquainted with the technological benefits the libraries can derive. Another of the modern emerging concept sought in library services is **"Information Literacy"** that includes, computer and internet literacy programmes to enhance the user capabilities to learn to search and use information resources, particularly electronic resources on and off the web, as part of **life long learning**. There should have been an emphasis on Information Literacy in the Library Services.

8. Encourage greater community participation in library management.

9. Facilitate donation and maintenance of private collection.

10. Encourage Public-Private Partnership in developing of library and information services.

The public libraries are more prone to this aspect. The areas of community participation and levels of participation should have to be spelt clearly. The augmentation of private collection is again the role to be played by the Public Libraries at all levels – National, State, City and District libraries. The state archives are engaged in this kind of work, but the overlapping of the functions has to be eliminated. Public – private participation is a new buzz word, and the kind of participation seen in other sectors is very moderate and the continuation and maintenance of the facility again rests with the public domain which lacks in its performance. However it is try out in the case of public libraries, yet the public library system, is built on the funding from the general public, yet India has to see donor either like Sir Andrew Carnegie or Mr. Bill Gates, in this context.

The Executive Summary on the International Seminar "Libraries on the Agenda" has deliberated in four sessions. The session- 1 has discussed on "Role and Authority of the National Mission as a Advocate for Library Development in India". It comes out with a administrative structure and the functional aspects of the National Mission for Libraries. The feedback received from the library professional and stake holders does not contain any serious issues that can be considered for discussion here.

7. CONCLUSION

An objective review and assessment of the proposals and recommendations of the WG on libraries, set up by NKC is made here. The inhibited apprehension in the minds of the authors is that the Commission has moved forward to a considerable level of decision making and implementation of the WG recommendations. Yet it is hoped that the amendments and suggestions generated from the short haul study of the documents of NKC and WG on libraries, and in particular the latter, would be given serious consideration by the NKC . It is hoped that the delegates of this conference would welcome them and may add their views to add value to the contents of this paper.

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National Knowledge Commission: A Roadmap for University Libraries in the 21st century

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Abstract: Discusses the role of National Knowledge Commission for development of libraries in the modern context. Presents a brief picture of the NKC recommendations. Study deals with objectives of NKC, approach to achieve the objectives like access, concepts, creation, application and services. Explains organization of National Knowledge Commission and its recommendations for development of library activities. Finally highlights the functioning of proposed Indian Institute of Library and Information Science (ILIS), and National Mission on Library.

Keywords: National Knowledge Commission, Mission, and Library Professionals

1. INTRODUCTION

A library is not a building stacked with books, it is a repository and source of information and ideas, a place for learning and enquiry, and the creation of new knowledge. The 21st Century has been acknowledged worldwide as the 'Knowledge Century'. Every nation now finds itself operating in an increasingly competitive and international environment where the information infrastructure, research and innovation systems, education and lifelong learning, and regulatory frameworks are crucial variables. In the next few decades India will probably have the largest set of young people in the world. The libraries have a recognized social function in making knowledge publicly available to all. They serve as local centres of information and learning, and local gateways to national and global knowledge. To nourish the dream vision 2020 of our former President of India, Honourable Dr. A.P.J. Abdul Kalam in this era of wide spread technology, Government of India has constituted the National Knowledge Commission (NKC) in 2005. Our Prime Minister Dr. Manmohan Singh has taken an initial step of implementing the National Knowledge Commission (NKC) in these words *"the time has come to create a second wave of institution building, and of excellence in the fields of education, research and capability building."*

2. OBJECTIVES OF NATIONAL KNOWLEDGE COMMISSION (NKC)

The following are the major objectives of National Knowledge Commission for overall development in India.

2.1 Access to Knowledge

Access is one of the most fundamental issues in a knowledge society. Even if universities, research institutions and laboratories produce large amounts of knowledge, it will be of little use until the majority of the population actually possesses adequate means to acquire, absorb and communicate to knowledge.

2.2 Knowledge Concepts

Advances in knowledge and its applications are products of human endeavors; therefore it is of utmost importance that we nurture the skills and intellectual capacities of our largely youthful population in order to build a strong base of human capital that can transform India into a strong knowledge economy.

2.3 Knowledge Creation

Creation of new knowledge principally depends on strengthening the education system, promoting domestic research and innovation in laboratories as well as at the grassroots level, and tapping foreign sources of knowledge through more open trading regimes, foreign investment and technology licensing. Although India has the option of borrowing or buying new knowledge from abroad, it is important to create self-sufficiency by promoting indigenous research, especially in Science & Technology. Science and Technology has the ability to accelerate the processes of other parallel knowledge objectives, leading to economic growth and security.

2.4 Knowledge Application

The creation of knowledge cannot be directionless. To derive maximum benefits from our intellectual assets, we must apply knowledge in fields like agriculture, industry, health, education etc. where productivity can be enhanced. Knowledge application is both a goal in itself and a facilitator of progress in these important sectors.

2.5 Knowledge Services

Investment in knowledge services will produce large-scale benefits for the common man. Technology has the potential to make government services and functioning more accountable, transparent and efficient. E-governance can change the way in which the citizens of India perceive and interact with the government.

3. APPROACH TO ACHIEVE THE OBJECTIVES

3.1 Access

The concept of access to knowledge is made up of four components.

- Individuals must possess the ability to receive and comprehend knowledge.
- The means must exist for individuals who have the ability to receive and comprehend knowledge to readily obtain it.
- Accurate knowledge of the state and its activities should be made available to the general public.
- Access is about increasing the reach and opportunities of individuals or groups excluded from mainstream knowledge systems.

3.2 Concepts

Knowledge concepts are organized, distributed and transmitted through the education system. Education is a potent force for any developing state. It encourages individuals to

- Think independently
- Make better-informed decisions

- Keep abreast of important issues and trends at the local and national level
- Question existing socio-economic arrangements in a manner that leads to innovation, change and development.

A good education system relies largely on a complex interface of human resources, pedagogical methods, curricula, infrastructure and academic standards. These are all important variables, at every level and in every field of education.

3.3 Creation

A nation can develop in two ways – either it learns to use existing resources better, or it discovers new resources. Both activities involve a significant amount of knowledge creation by way of research and innovation, primarily in the field of Science and Technology. Innovation is a product of research and an essential ingredient of progress in Science and Technology. However, in relative terms, India lags behind the West and developing countries like Brazil and China.

The above considerations suggest that measures need to be taken to make India a leader in Science and Technology in the coming years. For this it will be important to:

- Promote research in institutions of higher education.
- Link research in public institutions with industry requirements to foster a symbiotic relationship.
- Diversify the funding sources of research institutions and universities.
- Augment the Research development infrastructure.
- Promote to inter-disciplinary studies in science and technology.

3.4 Application

Knowledge can be productively applied to promote technological change and facilitate the reliable and regular flow of information. This requires significant investment in goal-oriented Research and Development along with access models that can implify market transactions and other processes within an industry. Recent non-public initiatives in the fields of education, communication and agriculture have further demonstrated that knowledge can be very effectively applied for the betterment of the rural poor. The NKC has identified some areas where knowledge application will produce significant benefits. These areas are education, agriculture, health, arts, culture and rural areas.

3.5 Services

The use of knowledge services, more popularly known as e-governance, has the potential to simplify many different points at which citizens interact with the state. Traditionally these points of interaction have been vulnerable to unscrupulous activities and rent seeking. They have also created a culture of fear in the people, who often find themselves completely at the mercy of frontline government officials while trying to access public services. Technology provides us with an opportunity to eliminate these unsavory elements of our democracy and its bureaucracy, and to ensure accountability, transparency and efficiency in government services. The Benefits of e-Governance are as follows;

- Reducing the cost and improving the reach and quality of public services.
- Reducing transaction costs and transaction times.
- Empowering citizens and increasing transparency of government functioning.
- Re-engineering of processes that results in greater efficiency and productivity.

4. ORGANIZATION OF NKC

NKC consists of seven members, including the Chairman. All members perform their duties on a part-time basis and do not claim any remuneration. A small Technical Support Staff headed by an Executive Director seconded to the NKC by the government assists the members in their duties. The Planning Commission is the nodal agency for the NKC for planning and budgeting purposes as well as for handling parliament submissions or responses. A National Steering Group for the NKC has been created under the chairmanship of the Prime Minister. This group includes the Ministers of Human Resource Development, Agriculture, Commerce and Industry, and Communication and Information Technology, the Deputy Chairman of the Planning Commission, and the Minister of State for Science and Technology.

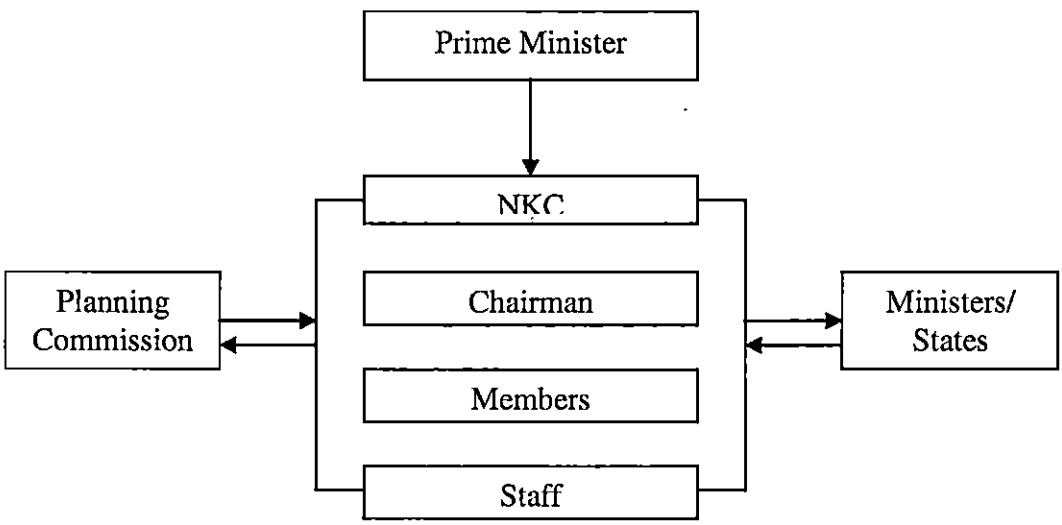


Fig. 1

5. RECOMMENDATIONS OF NKC FOR DEVELOPMENT OF LIBRARIES

The National Knowledge Commission has made the following recommendations to ensure sustained attention to development of libraries.

5.1 Set up a National Commission on Libraries

NKC suggested the set up of an autonomous National Commission on Libraries, a permanent and self-dependant statutory body to encounter the information and learning requirements of the Indians. To launch the process in mission mode, a National Mission on Libraries should be set up immediately, for a period of three years. The Mission should be converted into a permanent National Mission on Libraries in not more than three years, to become an important part of the development process.

5.1.1 National Mission on Libraries

Library and information services are fundamental to the goals of creating, disseminating, optimally utilizing and preserving knowledge. They are instrumental in transforming an unequal society into an egalitarian, progressive knowledge society. Developments in Information Communication Technology (ICT) have enabled libraries to provide wide public access to all, and to bridge the gaps between the local, national and global levels.

Yet the library and information services sector in India has not kept pace with the paradigmatic changes taking place in society. The role of the proposed National Mission is as follows:

- To promote libraries and information services
- To suggest the government on libraries and the information sector
- To set standards for collection, services and technical processing
- To encourage public-private participation and interact with State Governments
- To conserve the cultural heritage and set up a system for monitoring the working of public libraries
- To review and assess the education and in-service training needs of the sector;
- To support research development and technological development
- To ensure access to all publications, including government and institutional public documents

5.2 Prepare a National Census of all Libraries

A national survey should be conducted to create a national census of all libraries. Collection of census data on libraries would provide baseline data for planning. The task force that has been set up by the Department of Culture for this purpose should be given financial and administrative support to implement this activity and complete the survey on a priority basis. Survey of user needs and reading habits should be periodic at the national level as part of the National Sample Survey.

5.3 Revamp LIS Education, Training and Research Facilities

To keep the LIS sector abreast of latest developments, necessary encouragement should be given to research after evaluating the research status in LIS. The proposed Mission/ Commission on Libraries must assess as soon as possible the manpower requirements of the country in the area of LIS management, and take necessary steps to meet the country's requirement through LIS education and training. Keeping the above in view, it is felt that a national institute for advanced training and R&D (suggested name: Indian Institute of Library and Information Science) needs to be set up.

5.3.1 Indian Institute of Library and Information Science (ILIS)

Research and development activities in library and information services today are extremely limited. Though concerned with global information resources, the sector needs to pay close attention to the local environment. India's diversity of socio-economic-cultural factors, the multiplicity of languages, varying levels of literacy and educational achievements and of access to information and communication technologies, make it essential that planning for library and information services take into account the ground realities. The exponential rate of change and innovation relating to this discipline also warrants intensive R&D initiatives. It is also necessary to provide guidelines and training for the use of tools and technology, so that research results are effectively utilized. It is generally accepted that the present search engines lack semantic knowledge of the documents processed. Whether it is a huge collection of information within a library or Internet, the tools and techniques that have long been used by Library and Information Science professionals will be to immense help in making the Web a "Semantic Web". The proposed Institute would have two major functions:

a. To offer training programmes in relevant areas and to conduct continuing education programmes including training for library and information professionals.

b. To identify, sponsor and conduct Research Development programmes in the field of library and information science, including newly emerging research areas.

Following are the additional functions of ILIS for upliftment of libraries:

- Standardization of Indian names
- Vocabulary control over Indian subjects developed in terms of multi-lingual thesauri and subject heading lists
- Development of open source software
- Development of Digital Libraries.
- Technical standards for Indian scripts, Optical Character Recognition (OCR) for Indian scripts, and search engines, which can implement stemming algorithms for Indian languages
- User needs and reading habits for different groups
- Organization of community information and development of appropriate standards.

The Institute will also undertake activities to disseminate research findings, through printed and online publications, seminars and conferences, or web portals.

5.4 Re-assess Staffing of Libraries

Keeping in view the changing scenario and new responsibilities, the existing staffing pattern, duties, qualifications, designations, pay scale, career advancement, service conditions of library staff in different types of libraries and departments of library and information science recommended by NKC. The National Mission may also review the existing designations.

5.5 Set up a Central Library Fund

A specified percentage of the Central and State education budgets must be earmarked for libraries. In addition, a Central Library Fund should be instituted for upgrading existing libraries over a period of 3-5 years. Initially, the value of funds from the Government sector may be Rs. 1,000 crores, which may be matched by the private sector through corporate philanthropy. The National Mission/ Commission on Libraries should administer this fund.

5.6 Modernize Library Management

Libraries should be so organized and the staff so trained that they become relevant to user communities in every respect. Also, to optimize resources, efforts should be made to synergize the strengths of different types of libraries through innovative collaboration. All libraries should meet four basic objectives of library and information services on site: lending materials, providing reading facilities, providing assistance for reference, and providing Internet access. These should all be available free of charge. All institutions and organizations that run their own libraries to ensure that they meet these four objectives must take appropriate steps. The Government of India should issue a notification to all institutions and organizations to take appropriate steps to ensure that libraries working under their aegis meet these objectives. Individual libraries should be asked to display their objectives in the form of a library charter. This sample charter expresses what a library should pledge to provide. The library charter recognizing that the library's objectives are to:

- Disseminate knowledge as widely as possible
- Serve as a major vehicle to facilitate creation of new knowledge
- Facilitate optimal use of knowledge by all sectors, such as government, industry, rural sector and civil society

- Ensure that people from all sectors and all parts of the country have easy access to knowledge relevant to their needs, in their own language.
- Serve as the local centre of information and a gateway to national and global knowledge providing fair access to knowledge and information to as many users as possible
- Offer an inviting and attractive physical space with clean drinking water and toilet facilities
- Offer proactive services to its user communities
- Ensure that users are treated with courtesy and respect by library staff
- Pay attention to the needs of children, women, senior citizens and the physically challenged
- Optimize its potential to provide access to information and knowledge to all;
- Help users develop information skills to make optimum use of resource
- Improve its collections and services on a continuing basis in consultation with users
- To work more effectively and efficiently by undertaking every activity in a professional manner
- To bridge the gap between the information poor and the information rich.

5.7 Networking of Libraries

The key to opening the resources of a library is its access mechanism. In today's context it is possible to use technology to bring together the resources of small individual libraries into one seamless large library. The ability to retrieve information from this library depends on standardization of classification, cataloguing, database structuring and exchange formats. NKC recommended that the Networking of different kind of libraries should be undertaken in different phases.

5.8 Services to be provided by Libraries

To provide access to knowledge and resources, each library must provide a range of services to meet the needs of a diverse user community.

a. Kinds of services to be provided by all libraries:

i. Lending of materials for home use

ii. Reading facilities on premises

iii. Reference service

iv. Providing Internet access

v. Inter-library loan

vi. Photocopying

vii. Document delivery, including Electronic Document Delivery (EDD)

viii. Extension services in public and academic libraries for women, children, senior citizens and physically challenged persons

ix. Community information services

x. Online public access catalogue (OPAC)

xi. Electronic/Audio-Video resources, workstations and appropriate infrastructure for use and delivery

xii. Training users in information literacy

xiii. Institutional repositories of research articles, reports, institutional publications and Electronic Theses and Dissertations (ETD)

xiv. Websites, portals, subject gateways, etc (especially in case of special libraries)

xv. Digitization of rare resources

xvi. Identify non-users and promote the use of libraries among them

xvii. A periodical review to determine the needs of users and effectiveness of services should be conducted by libraries.

b. Consortia of libraries and institutions with a common membership should be instituted, facilitated and encouraged.

c. Besides offering routine library services, libraries should initiate new and imaginative services in consultation with the local community relevant to their needs.

d. All academic institutions must set up institutional repositories of ETD. This should be made mandatory for accreditation. Such repositories should offer open access.

e. All public academic and research institutes should be encouraged to set up freely accessible institutional repositories of their full-text articles and publications subject to copyright restrictions.

5.9 Encourage greater Community participation in Library Management

It is necessary to involve different stakeholders and user groups in the managerial decision-making process of libraries. Public libraries must be run by local self-government through committees representing users of the library. These committees should ensure local community involvement and should be autonomous enough to take independent decisions to conduct cultural and educational community based programmes. Libraries should integrate with all other knowledge-based activities in the local area to develop a community-based information system. In the rural sector, the responsibility for village libraries/ Community Knowledge Centres must lie with the Panchayats. These should be set up in close proximity or on the premises of schools.

5.10 Promote Information Communication Technology (ICT) applications in all Libraries

The catalogues of all libraries should be put on local, state and national websites with necessary linkages. This will enable networking of different types of libraries and setting up of the National Repository of Bibliographic Records and a centralized collaborative virtual enquiry handling system using the latest ICT. To enable equitable and universal access to knowledge resources, libraries should be encouraged to create more digital resources by digitizing relevant reading material in different languages, which can be shared at all levels. Peer reviewed research papers resulting from publicly funded research should also be made available through open access channels, subject to copyright regulations. It is recommended that open standards and free and open source software may be used for the above.

5.11 Facilitate Donation and Maintenance of Private Collections

There are numerous rich private and personal collections in India, which need to be identified, documented and preserved for posterity. While there is a need to create a decentralized model for identification of personal collections, it is also necessary to sensitize organizations to receive and preserve donations of personal collections through a simplified process. The National Mission/ Commission may set up a committee on private and personal collections under the chairpersonship of an eminent scholar. Since special facilities for maintaining private/personal collections are not easily available, it is suggested that Ten Regional Centres with specific mandates be set up in different parts of the country for this purpose.

5.12 Encourage Public Private Partnerships in LIS Development

NKC advised that Philanthropic organizations, industrial houses and other private agencies should be encouraged through fiscal incentives to support existing libraries or set up new libraries. Also, the ingenuity of civil society may be utilized for preparing necessary infrastructure to meet the special ICT needs of the LIS sector.

6. NKC RECOMMENDATIONS AND UNIVERSITIY LIBARRIES

NKC recommendations are very much useful for the library authorities, in streamlining their functions and services. The university libraries will emerge as a dynamic source of knowledge, if the recommendations in its various ramifications are adhered to. The first step to give it a practical applicability is the use of Information Communication Technologies in the library resources and services. The recommendations regarding the Internet connectivity, digitization, open sources, gateways, portals, networking, Web OPAC, and inter-library loan facilities will definitely enhance the resources and the users, who will be benefited with prompt services and will be time saving as well. The university libraries have to redefine their policies and services to play the key role in the Knowledge dominated society in providing the need-based information to its members. The Use of ICT in Library services will enable the remote users with access to latest information across the world. This will automatically enhance the reputations of the library services among the members in a university with too many colleges.

7. CONCLUSION

NKC recommendations highlight some basic lacunae such as the lack of a comprehensive census of libraries in the country. They focus on modernizing the management of libraries to ensure greater community participation. Leveraging ICT for various applications such as cataloguing, digitization of content, creating e-journals etc, is also highlighted. To give the sector-sustained attention, NKC recommended the setting up of an independent and autonomous National Commission on libraries, which would be responsible for undertaking a host of measures and streamlining all initiatives for the development of the sector.

The recommendations of NKC are really a boon and mission for the Library and Information Science Professional. It shows the importance of information in the digital era towards the development of the knowledge economy and the vision 2020. Actual implementation of the recommendations of the Knowledge Commission reinsure the quality and status of library professionals in coping with academics, IT professionals and executives in developing the knowledge economy.

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National Knowledge Commission: Inputs for Development of LIS Education and Libraries

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Abstract: Technological development, development of new information resources and other challenges before the LIS profession are needed to be address at national level. National knowledge commission of India played important role by recommending changes in the present scenario of LIS. Current changing environment demands changes in basic LIS education. National Digital library of India can play important role by coordination with libraries, Information centres, Library networks and libraries of national importance. NDL can provide different services by collecting and developing number of electronic resources. Present paper discusses the recommendation of National Knowledge commission and gives inputs for development of LIS education to improve present structure of LIS education. It also discusses some important issues to be incorporated for the development of libraries.

Keywords: National Knowledge Commission, LIS Profession

1. INTRODUCTION

National Knowledge Commission (NKC) was constituted on 13th June 2005 with a time frame of three years, from 2nd October 2005 to 2nd October 2008. As a high-level advisory body to the Prime Minister of India, the National Knowledge Commission has been given a mandate to guide policy and direct reforms, focusing on certain key areas such as education, science and technology, agriculture, industry, e-governance etc. Easy access to knowledge, creation and preservation of knowledge systems, dissemination of knowledge and better knowledge services are core concerns of the commission. This commission has made several recommendations to the Government of the India. All these recommendations were relevant and If implemented might have serve very well for the libraries and LIS profession. Since commission was set three years back it is worthwhile to add some more recommendations in it to incorporate the change.

2. LIBRARY SCIENCE EDUCATION

Library Science education should start from secondary education; this is right age to inculcate the habit of reading and thereby developing creative thinking. He/She should understand how the information is being generated and it flows through different channels this will develop interest among the students in different disciplines. The structure of the LIS education should as fallows.

1 Basic information resources should teach from fifth to tenth standard so that student should able to identify the different information resources and also develop good reading habits. This will also help students in identifying the subjects of their interest and choosing profession of their interest.

2 Library and information science as a subject should be offered as optional subject along with other subjects for eleventh and tenth standards. This will help students to choose LIS profession at their early stage.

3 Three years bachelor degree course Bachelor of Information Science (BIS) in LIS should be designed such that this course should include portion of Information Technology and Management along with Library and information science

4 Two years Masters course Master of Information Science (MIS) in LIS should be designed which include modern tools and techniques, which are required for the development of Libraries and Information Centers.

5 One full fledge University should be established in India for the accreditation, co-ordination and development of LIS education. This University should encourage research in LIS by providing fellowships and good infrastructure

3 NATIONAL DIGITAL LIBRARY

Developments in information technology (IT), including computers, storage media, software packages and Internet have eased the management of information generated worldwide. IT has made it possible to convert large volumes of information into machine-readable form as electronic databases that hold the key to improve information accessibility with ease and quickness. National Digital library (NDL) can play important role in this changing environment. NDL can have branches of libraries viz. National Digital Academic Library (NDAL), National Digital Public Library (NDPL) and National Digital Research Library (NDRL).

3.1 Collection Development

NDL should develop digital collection centrally and provide the access to all other libraries. There are different consortia's for serial publication in India. All these consortia's should be coordinated by NDL. Efforts should be made for purchasing rights for digitization of important foreign publications.

Important government publications, academic publications (Theses, dissertations, outputs of research institutions, Universities and important gray literature) should be digitized and made available free of cost to the public.

3.2 Digitization

NDL should act as a Central agency for Digitization of Important Publications and its dissemination. No other academic Institute in India should undertake any digitization projects without consulting NDL so that duplication is avoided. NDL should create and maintain the database of digitization projects both completed and ongoing.

There should standard rules and guiding principles for digitisation of various documents. Present copyright act in India is not sufficient therefore separate law should be framed for digitisation. USA has made "digital millennium copyright act" for this purpose.

3.3 Consultancy Services

NDL should provide consultancy services for other libraries for Undertaking digitization projects and Automation of libraries. This will help to avoid duplication of digitization work and promotion of the common software for library automation. NDL should devise standard format for bibliographic records in machine-readable format so that the other libraries can download records.

NDL should develop open source digital library software for Indian languages and promote it to achieve uniformity.

3.4 Publication

NLD should have its won publication division with the professional editorial boards and required infrastructure. Objectives of this division should be to develop and publish following resources in electronic form.

1 Publication of different bibliographies (By language, Subject etc.)

2 Publication of books and periodicals.

3 Publication of directories.

4 Publication of Indian reprints by purchasing rights from the copyright owners.

3.5 Information Literacy

Knowledge commission has recommended libraries to provide service like "Training users in information literacy". This service should be free and compulsory to all libraries. Moreover libraries or central agencies say "National digital library" (Proposed) should design different information literacy modules. Proliferation of electronic resources and increased use of Internet and online resources made users to rely on search engines for searching information. They often overlook the quality and reliable information resources available from libraries. This is one of the biggest change in front of the library professional therefore it is essential to work on developing information literacy skills to identify when information is needed, how to locate it and evaluate it. Information literacy modules will help students to identify subjects of their interests in their early stages of the life. This will also help in optimal use of library resources

3.6 Online E-learning Programmes for Library Professionals for Continuous Learning:

Knowledge commission has recommended offering training programs in relevant areas and to conduct continuing education programmes (including training of trainers) for the library and information professionals. Librarians who are working in different libraries do not have access to the current literature published in library and information science profession. It is not economically feasible to libraries to acquire books or periodicals in LIS profession only for few user therefore very few libraries acquire LIS documents. Library professionals from these libraries are not in position to upgrade their knowledge. Most of libraries have only one library professional in the library therefore it makes difficult for him to attend workshops or seminars. Information explosion and technological advancements brought new concepts, techniques and challenges to the profession. LIS professionals need to aware with these developments so that they can keep pace with these changes and design library services according to the changing needs of the users. e-learning portal will help LIS professionals to keep abreast with new developments in the profession, solve practical problems, development of new services, development of information literacy programs for users.

3.7 Library network

Network of all Indian libraries should be established under the NDL. NDL will coordinate with all library networks available in the country like INFLIBNET, DELNET, and CALIBNET etc. NDL should act as a network of all networks and also provide linkages with National Library, Raja ram Mohan Roy Library foundation, NISCAIR, National Manuscript mission and all other libraries in India.

3.8 Translation

In India literature is being published in many languages also there is important literature is being published in foreign languages. This literature is very useful to the users but because of language barrier

this literature has not been used. In India there are few institutions that are providing translation services. In science and technology National institute of scientific communication and information resources (NISCIR), DESIDOC, ONGC, BARC, BHEL, DRDO, HAL and several wings of defense, In Social sciences and humanities Sahitya Academy, NCERT, NBT, School of foreign languages Delhi, CIFL Hyderabad etc are providing translation service at some extent but there is need for central agency. NDL can play important role in this regard by maintaining databases of translators and experts from the different subjects.

3.9 Central Compact Storage

Space problem is very critical for libraries these days; exponential growth of literature makes libraries to think differently to solve this problem. In academic libraries different textbooks have been recommended for period of five years after that these textbooks becomes irrelevant, many libraries tend to Write off these books. Sometimes same text is being recommended after few years for the same course again they need to purchase these books. According to second law of library science "every book its reader" the book withdrawn from one library can be useful to the other library users, since different libraries has different type of user. Centralized compact storages at Universities will be useful to all college and University libraries. All academic libraries will store their withdrawn resources at central place that may be University to which the college is affiliated. In case of public library it may be at district place and in case of research libraries it may be at the research organizations of the national importance. Bibliographic database of these resources will be created centrally with location mark so that it can be accessible to anybody from any corner of the world. All these centralized storages will be connected through Internet or Internet.

3.10 Development and maintenance Library website and Library Portal

NDL should develop a portal, which will be disseminating current information on all subjects and support all Indian languages. The portal should provide links to the following electronic resources links.

1 Subject gateways
2 E- Learning modules
3 Information literacy module
4 Union catalogue of all libraries
5 Directories of subject experts.
6 Directories of Translators
7 Full text Periodical databases (Consortia), Full text Books, theses, Traditional Knowledge resources, govt. publications etc.
8 Indian national bibliography.

4. STAFFING PATTERN

Staffing in libraries is a subject of worry for India; in most of libraries you don't find qualified staff. Most of the libraries are having insufficient staff; because of this problem most of the libraries are not able to provide quality services to users.

4.1 School library

For school library the qualification of Librarian should be any graduate with Bachelor degree in library and information science and he should be treated as teachers.

Central school are having this kind of criteria but state board schools are not introducing this pattern. School library should have appropriate supporting staff with as per the size of the library.

4.2 Professional institutes

There are no uniform staffing patterns in all professional educational institutions.

For college library there should be One Librarian One assistant Librarian, Two Library assistant one clerk, two attendants and one peon

5. MODERNIZATION OF LIBRARIES

There is need of modernization all academic, public and research libraries in India. The present physical appearance of libraries is unable to attract users therefore there is need for development of good physical infrastructure. Government should provide special grants for the development of libraries like corporate offices or shopping malls. This will make difference as in case of British council libraries in India. Government also should provide grants for libraries to establish auditorium to organize cultural, educational, and entertaining Programme.

6. CONCLUSION

NDL could be an answer to all the problems, which are being encountered by library professionals in digitised environment. Recommendations given by the knowledge commission are very useful in changing environment but some more suggestions could be added to cover some current issues. The recommendation of knowledge commission should be implemented at earliest to get control over the present situation. As knowledge commission rightly pointed out "The ability of a nation to use and create knowledge capital determines its capacity to empower and enable its citizens by increasing human capabilities". In the next few decades, India will have the largest set of young people in the world. Following a knowledge-oriented paradigm of development would enable India to leverage this demographic advantage. In the words of our Prime Minister, "The time has come to create a second wave of institution building and of excellence in the field of education, research and capability building so that we are better prepared for the 21stcentury."

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Copyright Issues in Digital Media

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Abstract: The paper briefly touches about the digital technologies and copyright-related issues. The issues and concerns of librarians in the face of the intellectual property laws in digital media are highlighted. Characteristics of copyright implications with digital technologies and its adverse impact on knowledge Society and library services are discussed in detail. This paper also discusses Fair use and Not fare use rights in digital environment. It gives a brief idea to the readers about the copyright issues and its implications in the digital information handling.

Keywords: Copyright, Digital Media, Fare Use, Internet, Multimedia, Site Licensing, Software.

1. INTRODUCTION

Over the last few decades, libraries have undergone a transformation as we have incorporated computers into the structure of the modern library. This revitalization has allowed libraries to accomplish many things that were never thought possible before. Yet now that computers have become a staple in libraries everywhere, there was a dramatically quantum jump in the digital information resources made available through networks, particularly over the Internet and the WWW. Publishers of scholarly, academic and reference works from almost all fields of human knowledge started bringing them in digital form. According to InternetWorldStats.com 1,459 million users are connected to the Internet.

There are number of issues and concerns are associated with the usage of digital information. It is easy to create digital or digitized copies of material including text, image, audio and video; and this digital information can be distributed across the world through e-mail, electronic bulletin boards, websites and networks. The increasing use of primary and secondary mass storage media made it possible to download, store, display and print. Further, the downloaded documents can be modified or forwarded to others without the knowledge of its rightful owner. In comparison to printed information, electronic information is not so permanent; it is open to modifications, additions, deletions, revisions and manipulations without leaving any resemblance and difficult for detection. Unlike the case of printed materials, close monitoring and restriction of usage of electronic documents is difficult. Digital environment makes the issues related to copyright law a difficult task, as only element in knowledge society has not changed with advent of new technologies.

As fundamental copyright is not changed, many people believe copyright law is "Technology Neutral", they believe software, WebPages, Networks and Multimedia materials should be considered as Intellectual properties, just as books, music's and other pre-electronic forms of expression and they should adequately addressed and protected under current copyright law.

But others feel that the current law is inadequate and too limited to address the copyright issues created with these new forms of expressions and recordation that breaks new ground and creates its own copyright issues.

2. CHARACTERISTICS OF DIGITAL TECHNOLOGIES WITH COPYRIGHT IMPLICATIONS

The technologies that presently are raising issues for copyright law are those related to digital storage and transmission of works. There are a number of aspects to these technologies that have implications for copyright law, including the following:

Ease of Reproduction: Once a work is rendered in digital form, it can be reproduced rapidly, at little cost, and without any loss of quality. Each copy, in turn, can be further reproduced, again without any loss of quality. In this way, a single copy of a work in digital form can supply the needs of millions of users. We have seen how the compact discs (CDs) containing the original digital versions of recorded music and sold to consumers in the '80s and '90s have become the "masters" from which billions of copies have been made and distributed on computers and on the Internet in this decade.

Ease of Dissemination: The emergence of global digital networks allows the rapid, worldwide dissemination of works in digital form. Like broadcasting, digital networks allow dissemination to many individuals from a single point (although, unlike broadcasting, digitized materials need not reach each individual simultaneously). However, digital networks allow each recipient on the network to engage in further dissemination of the work, which can cause the work to spread at a geometric (sometimes called "viral") rate of increase. This, combined with the ease of reproducing works, means that a single digital copy of a work can be multiplied many thousands of times around the world within a few hours. When transmitted through high-speed transmission lines, like coaxial cable networks or even fiber optic lines, the process is even faster, and the capacity for the transmission of works grows as well.

Ease of Storage: Digital storage is dense, and it gets denser with each passing year. Ever-increasing quantities of material can be stored in a smaller and smaller amount of space. In the early 1990s, CDs, which can store over 600 megabytes of data, were perhaps the predominant form of digital storage used by commercial pirates for storing entire libraries of computer programs or sound recordings with aggregate retail values in the millions of dollars. Today's popular iPod portable music player can store nearly 70 times that amount (around 10,000 songs) in a device the size of a cigarette pack.

3. COPYRIGHT ISSUES IN DIGITAL MEDIA

3.1 Software

Fastest growing industry, the computer software industry has created its own set of copyright issues. Because most of the software programs can be easily copied and recreate perfectly.

Also extends possibility loading program onto more than one computer, which is not only infringing but also breaches license agreement that limits use to only one computer.

However, as tempting as this practice may be, it constitutes a major act of copyright infringement and software piracy. According to Business Software Alliance (BSA) 35% of the world's software is pirated, where in India its 69%.

3.2 Scanners

A scanner technology reproduces a photograph or other pictures in near perfect, without decreasing quality of the image. More importantly where copyright is concerned, reproduced image can be stored for future, can be used over and over, and even modified.

By reproducing, distributing, or modifying the copyrighted images without permission user infringing the fundamental exclusive rights of Copyright Owner.

3.3 Multimedia and CD-ROMs

The possibility of CD-ROMs seems endless as you can include images, music clips, sounds, Audiovisuals, animations, computer programs and text. But as endless new possibilities with multimedia publishing and CD-ROM technology Copyright concerns.

Now, if you want to expose your users to inspiring words of famous Quit India speech by Mahatma Gandhi, you are no longer limited to presenting the speech only in written form. By producing the work electronically, with CD-ROM version, your reader can hear the words spoken, may he or she can even see Mahatma delivering the speech, and you can also add accompanying music, narration and other images to make the effect of the message more dramatic.

There is no limit to your creativity! Unfortunately there is a limit- that is Copyright law. Each technological breakthrough adds a new copyright factor for multimedia developers to consider. To present Mahatma's speech in multimedia format, you need to request the rights to use more than just the words and speech and the photo accompany the text, need rights for the audio, video, music and any additional image you added.

3.4 The Internet and other Networks

Digital technology enables data to be copied without defect, manipulated, sliced and re-edited with great freedom and is a perfect technology for pirates. All these technical possibilities pose problems for copyright law in developing suitable techniques for catching up with the infringements. The information available on the Internet has the same copyright protection as if it were a magazine, publication, printed book, broadcast, etc.

The great myth is that the Internet is free for all in using vast available resources. In the public domain, material found on the Internet may be copied freely only if the information is created by the federal government or the copyright has expired or been abandoned by the holder. Any work published on the Internet is not automatically placed in the public domain. Information and other materials provided by others and used with permission, e.g. graphic images including Web graphics, photos, logos, digital art, writings, text, HTML, Java scripts or other material that people are given permission to use or display on Web sites, does not entitle anyone to claim copyright to the material in question. Graphic images provided by free or link ware graphics sites are not in the public domain. These images are not given in ownership but could be used, if they comply with the owner's terms and conditions. Fonts and dingbats, created point by point, drawn from scratch or through similar means, are copyrighted by the author. Scanned designs converted into fonts and dingbats or reduplication/ re-fabrication/alteration of existing ones are not original designs and do not entitle the individual to claim ownership. Hot-linking or linking directly to another Web site's images and/or spider-harvesting (robots programmed to index pages and pull images on to another server) is an unauthorized derivative work and constitutes a violation of the real owner's copyright.

Apart from Internet, there are many national, regional networks and intranets and extranets. Millions of people are linked thru these networks. Most of the content distributed over the networks is copyrighted or is under some sort of contractual licensing. Usually network users tend to think that non-commercial distribution is fair use and that it does not amount to rights violation. This leaves the network administrators in a spot over the liability of such infringements.

3.5 E-mail

Electronic mail or e-mail is the greatest threat to the Copyright Act. According to Software & Information Industry Association (SIIA) 75% of Internet users expect more people to know their e-mail address and more than 50% users prefer to communicate using e-mail rather than a telephone.

E-mail is fast and private way to transfer information between parties. Users must login to the online service to retrieve the mail. If recipients of e-mail messages want to take print or forward these private mails, they are in danger of committing copyright infringement. Forward feature allows users to send somebody's mail to one or many or to post on mailing lists or "Usenet" groups.

According to existing copyright act, e-mail messages fall into the category of literary works, copyright remains with author of message. The sender owns copyright on content and recipient owns the physical space the message takes up on his or her hard disk. The recipient does not have the right to copy, publish, or otherwise distribute the contents without permission.

3.6 Site Licensing

Nowadays most of the educational institutes and business organizations often employ "Site Licensing". A site license allows the institute to purchase the rights to unlimited use of the product within the organization/ institute.

A single master copy or single access to a product purchased, downloaded or used on two or more computers leads to the copyright breach and which is very easily traceable through network server. Information retrieved or downloaded from single access cannot be shared, and sharing the login details also copyright infringement.

4. I PAID FOR IT, WHY CAN'T I USE IT?

Part of the confusion over copyright and electronic content from the facts that content is easily accessible, storable, modifiable and sharable. Multimedia collections like images, music files etc, are easily available in the market with minimal prices, which is very tempt able to reuse the content. Even if you have purchased a collection, doesn't guarantee that you can use it in your own multimedia project, especially if you intend to sell it. Hot linking of images available on internet on price and freely is also copyright breach and it is also considered as bandwidth theft.

So whenever you are purchasing the online databases, software packages, CD-ROM collection, consider various levels of licensing agreements and always read carefully that what you are purchasing? Are you just purchasing 'information'; you are purchasing the rights to use the information a specific way and what are the limitations by the licensing agreement.

5. FAIR DEALING IN DIGITAL ENVIRONMENT

Joint Information Systems Committee (JISC) and Publishers Association (PA) UK set up a working party to study the application of the fair dealing and library privilege permissions in digital environment. They published their guidelines for Fair Dealing in an Electronic Environment in 1998, which can be adopted in Indian context. Following are the "Fair use" and "Not fair" instructions given by JISC and PA.

5.1 Fair Use

- Any incidental copying to disk involved in the viewing of part or all of an electronic publication.

- One accesses an electronic journal available on a Web site or from university/library network using the PC in his office. The browser automatically copies the article to his hard disk cache when he views the article.
- It is fair dealing for an individual to print onto paper one copy of part of an electronic publication for research or private study.
- A librarian can print onto paper one copy of part of an electronic publication at the request of an individual.
- One can access an electronic journal to which the library has a paid subscription, using an open access PC. He can print out a hard copy of the article for research or private study, assuming this is allowed by the license agreement.
- The librarian should not give the user a print out of whole of an electronic book but can provide one chapter.
- An individual can copy onto disk part of an electronic publication for permanent local electronic storage, where the disk is either a portable medium or a fixed medium accessible to only one user at a time but not for all of an electronic publication for permanent local electronic storage proper licensing is requires for it
- One can't download an entire electronic journal or an issue to his PC. It needs permission from the copyright owner.

5.2 Not Fair

- To scan the article into electronic form. It needs the permission, if granted, would cover whether the library could retain a copy permanently.
- Transmit by computer network of the whole of an electronic publication for the purpose of permanent local electronic storage, reading on screen, and printing on individual request
- All the articles of conference proceedings transferred to a re-writeable CD-ROM disk in a CD-ROM drive attached to one's computer so he can keep and read them at home.
- To post part or all of an electronic publication on a network or WEB site open to the public.
- To put an interesting group of journal articles up on the Department Web site for his colleagues to read. He must get permission of the copyright owners first.

6. CONCLUSION

Law can not keep pace with technology. All the efforts need to be made to amend copyright laws to cover technological impact on the associated legal issues and to include latest provision for the protection of copyright and also make safeguard for the interest of the users.

Most of the times users are not familiar with copyright laws and the kinds of activities which leads to copyright breaching. So users can be made aware through various literacy programs of the rights of the users and rights of the owner to avoid any legal conflict between these two and it is responsibility of modern days Library & Information Professional. Users also need to educate how to handle electronic information and what not come under the fair use doctrine.

So the modern day librarianship is "tension between providing good service to their patron and respecting the rights of the copyright owner.

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Intellectual Property Rights and Digital Technologies

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1. INTRODUCTION

The present era is the era of transformation of library from library 1.0 to library 2.0 and therefore the formats in which information is stored are either changed in comparison to print or converted into new digital formats of bits and bytes. The digital technologies have posed many pros and cons for the information and library professionals. Due to the flexibilities in handling large volumes of information, libraries are converting their valuable and rare resources into digital form. Digitization is the means to transform the traditional printed or electronic resources like microfiches, microfilms, video and audio tapes, etc., into digital form. The digitization has many advantages; some of these include (Deegan and Tanner, 2002):

(a) Immediate access to high demand and frequently used items;

(b) Faster and easier access to and enhanced ability to search the remotely held digital material;

(c) Ability to enlarge and enhance digital images;

(d) Preservation and accessibility of rare, fragile and out-of-print material;

(e) Integration of images, audio, video and text; and

(f) Reduction in the cost of document delivery.

Besides the above mentioned advantages, digitization has many more advantages like saving the storage space and maintenance costs, facilitating enhancement of digital resources, access by large number of simultaneous users and facilitating long time preservation of and archiving the intellectual capital of an institution for posterity (Moorthy, 2006). However a number of issues an concerns are associated with digital information like volatility, non-permanency, authenticity, plagiarism, facilitating easy piracy and mass distribution, vulnerability to manipulations, credibility, readability, etc (Lakshmana Moorthy & Karisiddappa, 1997, 1998, 2000, 2001, 2004, 2005). Some of the risks of digital information include alteration, reproduction, adaptation transmission/destruction, etc.

2. INTELLECTUAL PROPERTY RIGHTS

The intellectual property (IP) deals with the creativity of human minds which are in intangible form. To enjoy the rights associated with IP, the thoughts should be expressed in a tangible medium like a patent, design, writing (book, novel, poem, etc), sculpture, painting or art, etc. The intellectual property rights (IPRs) are the right given as the reward to the creators, inventors or the owners of respective intellectual works in the form of copyright, patent, trademark, etc.

The concept of intellectual property was very much accepted and enforced through legislation in the traditional print environment. But in digital environment where piracy is at a very high level, the protection of creators' right will become quite difficult. Digital environment makes copyright protection a difficult task. Issues and concerns associated with digital information include ease of creation, transmission and distribution of digital information across the globe through networks; the instantaneous downloading, storing, and printing or forwarding to others without the knowledge of its rightful owner, etc (Lakshmana Moorthy & Karisiddappa, 1997, 1998, 2000, 2001, 2004, 2005). Unlike the case of printed publications, close monitoring and re-striction of usage of digital works is difficult. In addition to this the open access and open source has also posed extra problems for the creators.

3. LEGISLATIVE PROVISIONS FOR IPRS

The Digital Millennium Copyright Act (DMCA) of USA is prohibits circumventing technological measures that are aimed to prevent copyright infringement and effectively control access to a work protected by copyright. Technological access controls are mechanisms that restrict copying the work or playing it in a particular environment without authorization such as passwords or encryption algorithms that prevent viewing or listening to a work without authorization or digital watermarks or digital signatures (both visible and invisible) that discourage infringements and also help in identifying the violators, etc. The law contains two provisions that prohibit trafficking in devices that circumvent technological measures of protection.

The first provision is aimed at devices and services that circumvent access controls. Specifically, it prohibits manufacturing, importing, offering to the public or providing or otherwise trafficking in technologies, products, or services

- That are primarily designed or produced to circumvent a technological measure that effectively controls access to a copyrighted work;
- That have only limited commercially significant purpose or use other than to circumvent such controls; or
- That are marketed for use in circumvent such controls.

The second, similarly worded provision is prohibition against trafficking in devices or services to circumvent rights controls, that is, manufacturing and supplying any equipment capable of circumventing copyright protection is illegal. Besides the DMCA, USA also enhanced a number of legislations like Consumer Protection Act for Digital Products, Audio Home Recording Act (customers' rights to copy), Anti-Electronic Racketeering Act, No Electronic Theft (NET) Act, Online Copyright Infringement Liability Limitation Act, Uniform Computer Information Transaction Act, Anti Cyber Squatting Consumer Protection Act, Public Access to Information Act, etc to protect or to ensure rights of legal customers (consumers) of products protected by IPRs.

Similar legislations include the Directive on Legal Protection of Computer Programs, Conditional Access Directive, Harmonization of Copyright & Related Rights in Information Society, etc by the European Union; Australian Copyright Amendment (Digital Agenda) Act; It Act of India, etc. Many developed and developing countries like UK, Canada, Singapore, Malaysia, Japan, etc have all enacted such laws in the face of grave challenges posed by the digital technologies.

The Copyright Act, 1957 as amended in 1998 protects digital works like databases as literary works under section 2(o) of the Act. It must be noted that the definition of literary work is inclusive in nature and it is capable of encompassing more categories. Secondly, the concept of compilation

used in this section is itself inclusive in nature and the compilation of databases is one of them. Thus, the expression compilation, as used in section 2(o), includes at least two forms of compilations viz. compilations for the purpose of conferment of Copyright and compilation for the purpose of Data Protection.

4. PROBLEMS POSED BY THE DIGITAL TECHNOLOGY

Apart from illegal copying, unauthorized downloading and transmission to third parties, etc the digital technologies have given way to several new concerns, some of which are listed here.

4.1 Cyber Fraud

Cyber crime encompasses any criminal acts dealing with computers and networks (called Hacking). Additionally, cyber crimes are illegal activities are committed through the use of a computer and the Internet like identity theft, impersonation, credit card frauds, phishing, etc.

4.2 Cyber Squatting

Cyber squatting is the purchase of a domain name in bad faith. Usually this is done with the intention of reselling that Domain name back to the legal copyright holder at an exorbitant price. This is violation of the trademark laws.

4.3 Cyber Stalking

Cyberstalking is use of the Internet or other electronic means to stalk someone. This term is used interchangeably with online harassment and online abuse similar to following a person, appearing at a person's home or place of business, making harassing phone calls, leaving written messages or objects, or vandalizing a person's property.

4.4 Plagiarism

This involves lifting research papers, reports, etc directly form the Internet and submitting them without acknowledging the sources. Academics face this problem every day. Many research publications and even PhD theses are just copied and submitted to scholarly periodicals and unsuspecting professors. Many cases are reported regularly by scholarly periodicals like Nature, Science, ACM Communications as well as whistle blowers like Society for Scientific Values (India) etc.

4.5 Phishing

Phishing is an attempt to criminally and fraudulently acquire sensitive information, such as usernames, passwords and credit card details, by masquerading as a trustworthy entity in an electronic environment. It is carried out by email or instant messaging and often directs users to enter details at a website exactly resembling the original legal website, although phone contact has also been used.

5. TECHNOLOGIES FOR SAFEGUARDING INTELLECTUAL PROPERTY

Several technologies have been developed (and many more are being developed) to provide digital information such as electronic copyright management systems and **Digital Rights Management** (DRM) technologies. Many academic institutions and publishers took initiatives to develop secure technologies for deliv-ering electronic information to users, especially in a network environment. These include Performing Arts Teaching Resources Online (Patron), Electronic Reserve Copyright

Manage-ment System (Ercoms), and the Elec-tronic Library and Information Retrieval Online Project (ELINOR), Project Cited, RightPages TM Service, TULIP, Security and Rights Management System (for a brief description see Lakshmana Moorthy and Karisiddappa, 1996, 1997 and 1998). Use of cryptology (usage of encryption and decryption for security and privacy of information in cyberspace), digital signatures (of publisher/customer identity, ID numbers, date, time, unique transaction number), digital watermarks (digital signals or patterns inserted into a digital document) are discussed elsewhere (Lakshmana Moorthy and Karisiddappa, 1998). Argent, Cognicity, Copysight, EIKONAmark, Giovanni, JK_PGS, Musicode, Digimarc, PixelTag, StirMark, SureSign, SysCoP, unZign, etc are some of the watermarking tools available in the market place for the purpose (Roy, 1999).

5.1 Digital Rights Protection Technologies

Digital rights management technologies (also known as electronic rights management systems) ensure copyright through identifying and protecting the content, controlling access to and use of the work, protecting the integrity of the work, and ensuring payment for the access. These use one or more technologies to ensure access to bona fide users only. DRM technologies prevent illegal users from accessing the content; they make it more difficult for illegal users to access digital content. DRM controls access rights using **Technical Protection Measures (TPMs) like** encryption, watermarks, electronic marking; distribution of content and providing access keys to authorized consumers, enforcing permissions, transaction processing, and also usage tracking. The DRM software facilitates mode of **payment** (e.g. pay-per-use, subscription, licensing), **rules for accessing** (e.g. first few pages free, pay for the rest) and **distribution**. Variations include prepaid mode where the user pays before downloading; rental where the content is allowed for a fixed period of time or number of times the content is viewed (usually under licensing agreements); or subscription (annual, one-time payment); etc.

DRM governs rules for the use of content and also uses all technologies to ensure that only legal and authorized users who paid for the content are able to use a digital resource. The content use is controlled through disabling printing and downloading options, copying only a portion of the work, copying specified number of times through copy generation management systems, and disabling second generation copying from the first copy (from the original). The integrity of the work is ensured through scanned images, digital watermarking, encryption, digital signature, etc.

The major benefit of DRM is that it allows a user pay for actual use of a digital resource as against where a user pays in advance for potential copies which in many cases may not be the case. In the light of the estimated market of DRM technologies in 2005 was more than $3.5 billion, the usage of DRM technologies today is widespread, entertainment industry being the foremost. Although it is intended to be a fair way for legitimate use of digital content, there will always be efforts to circumvent them for pecuniary benefits. Many companies like Adobe, ContentGuard, IBM, Microsoft, etc offer DRM technologies.

Another way to protect digital content is through **Technical Protection Measures** (TPM). These technologies allow publishing companies in securing and protecting content such as music, text and video from unauthorized use. They disallow copying and possible other uses of digital files by electronic marking and tagging or by encryption thereby making them unreadable. These technologies control access to content. If an author wishes to collect fee for use of his or her work, then DRM technology can be used. The TPM and DRM technologies are increasingly employed to sell and distribute content over the Internet.

5.2 Other Solutions

Open Access: Open access literature is digital, online, free of charge, and free of most copyright and licensing restrictions. The Internet and the consent of author make it possible for the wide dissemination and usage of information without the fear of infringement or violation of IPRs. Open access repositories provide access to the world's research and increase the democratization of knowledge, and suggest that repositories can also contribute in terms of the larger impact of research for the social good. There are clear benefits to society and to the taxpayers that indirectly fund a large proportion of scholarly research. The core concept of open access is removing price barriers (e.g., subscription fees) and permission barriers (e.g., copyright and licensing restrictions) to royalty-free literature (i.e., scholarly works created for free by authors), making them available with minimal use restrictions (e.g., author attribution).

5.3 Open Notebook

The basic philosophy behind the open notebook science is to have no insider information. Essentially all the information that is available to the research community is available to the rest of the world.

5.4 Institutional Repositories (IR)

It is an online database of research output of an organization for preserving and publishing the digital contents. IR generally adheres to an open access model, by centralizing and preserving the knowledge of an institution and making it accessible over a network, preferably internet. Institutional repositories are not discipline-specific, and aim to archive the entire range of an institution's scholarly output. IRs form part of a larger global system of repositories, which are indexed in a standardized way and searchable using one interface (thanks to a common protocol, OAI-PMH) by harvester software, providing the foundation for a new model of scholarly publishing. The paradigm shift in the social and technological arena surrounding the information and knowledge cycle or generation of scholarly literature is indication of the radical shift towards institutional repositories (Shashi Nath and Sridhara; 2008).

6. COPYRIGHT PROTECTION

6.1 Copyright and Databases

Computer databases are treated as compilations/collective works and protected by Berne Convention, WIPO Copyright Treaty, TRIPS Agreement. The creator or developer of the database is generally treated as its author. It is protected through copyright, contracts, license agreements, technological means (keys/ dongles), ECMS, etc

6.2 Copyright of Multimedia Works

It is covered under audio visual or derivative works. Commissioned multimedia works are treated as works made for hire person/institution commissioning the work will be the copyright owner. These works can be protected through signal processing, data compression, encryption, and incorporation of visible/invisible watermark or a digital signature multimedia protection protocol.

6.3 Copyright and Websites

When creating a Website, if one wants to use some neat images found on the Web with due credit to the artist, one needs permission as copyright applies to the Web (free access is not public domain; proper credit (citation) is important to academic plagiarism, but not to copyright).

6.4 Copyright and Computer Software:

The computer software can easily duplicate, download without any loss of quality and distribute through networks/Internet. It is tough to distinguish the pirated copies from Originals. These can be protected through Copyright & Patents Hardware/Software Locks/Dongles.

7. ASSIGNMENTS AND LICENSING OF INTELLECTUAL PROPERTY

Advances in technology have often posed challenges for intellectual property (IP) law. The information age brings both promises and perils to content creators and content consumers alike. Hosting information online makes it available to an unlimited audience, from anywhere in the world. At first glance, this is wonderful as for the information consumers, the digital holdings of libraries around the world become continuously available from a home computer. For authors and publishers, information technologies provide new opportunities and markets enabling them to reach the corners of the world. But how many copies of the work will be sold (or licensed) if networks make possible planet-wide access to any electronic copy of a work (Samuelson, 1995). For protecting IPRs, publishers and owners of intellectual property resort to licensing or assignment of rights to the consumers for a definite period of time.

The ownership of intellectual property can change for various reasons and in different ways. The charge in ownership may be voluntary or non-voluntary. The two most common legal instruments of voluntary ownership transfer are licensing and assignment.

7.1 Licensing

License is a legal method of voluntary transfer of ownership of an intellectual property over a definite period. In simple words this is the permission by the owner of an IP to another persons or legal entity to perform or enjoy the exclusive rights of the owner as per the mutually agreed terms and conditions during a mutually agreed period of time. The legal documents evidencing the permission by the owner of IP is usually referred to as a license agreement or a contract. The owner of IP who gives the permission is referred to as the licensor and the person or legal entity who receives that permission is called licensee. The license is usually granted subject to certain conditions which will be set out in the written document by which the license is granted to the license. License can be exclusive, i.e., the IP owner is not allowed to license the IP to any other persons in the territory and cannot even use the IP himself (e.g.: trademarks, patented inventions and exclusively created databases or computer software programs). In the case of a non exclusive license, of course, the owner may use the IP himself and even allow others to use it.

7.2 Compulsory License

Under this provision in the IPR laws, exploitation of an invention, patent may be carried out without authorization, but with the obligation to compensate the owner of rights. These licenses are non-voluntary because they are authorized by the law and do not result from the exercise of the copyright owner's exclusive right to authorize particular acts. Non-voluntary license are usually created in circumstances where anew technology for the dissemination of works to the public had emerged, and where the national interests—economic, public well being—are at stake that owners of rights would prevent the development of the new technologies, products etc by refusing to authorize use of IP.

As library and information science professionals deal with a variety of information products/ service, they should be knowledgeable in the areas of high concern like licenses of online and CD-ROM databases, licenses related to e-journal and e-books.

7.3 Assignments

Assignments are the most common form of change of ownership. They are normally, but not necessarily, part of a purchase contract. In this rights are sold against payment of a certain amount of money (for e.g. trademarks, patents). The concept of assignment is recognized in the laws of many countries. It applies to the copyrighted material, patented inventions, utility models, industrial designs, trademarks and other objects of industrial property. The legal act whereby the owner of the intellectual property transfers his exclusive rights to another is evidenced by writing in the form of a legal document generally referred to as an assignment. The transferor is called the assignor, and the other persons or entity, is called the assignee. When an assignment takes place the assignor no longer has any exclusive right in respect of the IP and the assignee becomes the new owner of the IP and is entitled to exercise all the exclusive rights (economic rights only) to the IP. Moral rights always remain with the author of the IP.

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Management of IPR With Special Reference to Copyright in the Digital Era: Role of Library Professionals

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Abstract: The advent of globalization and digital technologies has changed the engine of information used from manual and mechanical force to intellectual prowess. The paper has covered the various aspects of IPRs in digital environment with special emphasis on copyright management in digital form. This has significantly increased the importance of copyright and related rights and the potential conflict between the copyright holder's need to retain control and the users' right to make use of the reading material. The role of library and information professionals in managing the copyright issues has been described in detail in this paper.

Keywords: IPR, Copyright Issues, Digital Era, Role of LIS Professional

1. INTRODUCTION

Intellectual property (IP) generally encompasses the property whether it may be tangible or intangible in nature. It is purely the creation of human intellect. The distinctive of intellectual property is that it relates to information which can be incorporated intangible objects and reproduced in different locations and can be used by several persons at the same time, unlike immovable or movable tangible property' [1].

In the twenty-first century, a nation's ability to convert knowledge into wealth and social good through the process of innovation will determine its future. Hence, issues of generation, valuation, protection and exploitation of IP are becoming critically important. Thus, IP would be an important and effective policy instrument that would be relevant to wide range of socio-economic, technological, economic and political concerns. As per the obligations under the Trade-related Aspects of IP Rights (TRIPS), all the members of the World Trade Organization (WTO) are supposed to implement National Systems of Intellectual Property Rights (IPR) following an agreed set of minimum standards [2].

Intellectual property shares many of the characteristics associated with real and personal property as because it can be bought, sold, licensed or exchanged among others. On the other hand, the owner of the IP has the legal right to control or preserve it and at the same time, has to prevent the unauthorized use or sale of the property. But the most noticeable difference between IP and other forms of property, however, the form is that is intangible, that is, it cannot be defined or identified, only feel or realize, by its own physical parameters. It must be expressed in some discernible way to be protectable. As a result, legal provisions have been made by different countries of the world, to protect IP of individuals' creations by different countries of the world. The scope of protection and

the requirements for obtaining protection will vary from country to country. Currently, worldwide trend is towards harmonizing the national laws for obtaining equal benefits by any citizen all over the world.

1.1 What Is Intellectual Property Right?

Any property whether it is movable or immovable has to be protected in order to prevent it from piracy and at the same time the rights in property, resulting from the intellectual efforts of an individual need also to be protected from infringements. The process for protecting the property through legislation is called IPRs. The legal rights are given to the creators on their innovation for using, manipulating and ultimately handing over between parties during the period of protection.

It is very difficult to identify from one IP to another. A useful starting point is that IP 'comprises all those things that come from the human intellect, whether they are ideas, inventions, words (fact and fiction), music, theatre or art and would include books, (mechanisms), material on the Internet, individual items in a database, computer software, and even innovative piece of hardware that are subject to patent coverage [3].

1.1.1 Forms of IP

There are variations as to the set of rights forming the basket of IPRs. In general IPRs cover protection of a) Patents; b) Trademarks; c) Designs; d) Trade Secrets; e) Copyrights; f) Geographical Indications; g) IC Layout Design; h) Tangible Research Property; and i) Plant Variety Rights.

The IP can be broadly classified into copyright and related rights and industrial property rights. Copyright and related rights relate to the cultural field and cover all literary an artistic expressions as well as artistic performances and broadcasts. On the other hand, industrial property rights are so called because they are of great relevance to production and distribution of industrial goods.

For every right there is a legal bias that can be expressed explicitly; for copyright these include piracy, infringement, data protection etc. that lead to legal implication. Oxford dictionary defines 'infringe' as 'one who appropriates or reproduces without leave, for his own benefit, a literary artistic or musical composition, or an idea or invention of another, or more generally, anything that, he has no right to; specially one who infringes on the copyright of another'.

1.2 Copyright

Copyright is the right of preventing illegal copying from the original work of the creator(s). That creation may be artistic, musical, literary dramatic, sound recording or cinematographic film. The creators and producers are called 'authors' and their output termed as 'works'. 'A dramatic work includes any piece for recitation, choreographic work or even entertainment in a dumb show, form of which is fixed in writing or otherwise' 'Musical works include any graphical notation of a musical work' [4]. 'The expression 'artistic work' includes painting, sculpture, drawing including a diagram, map, chart or plan an engraving or a photograph, irrespective of their artistic quality, a work of architecture and any other work of artistic craftsmanship' [4]. Whereas, 'copyrights generally lasting during the life time and till the end of sixty years after the death of the author'. On the other hand, 'related rights are rights of performers and broadcasting organizations, who communicate works of authors to the public through performance or broadcasting. During the continuance of the performer's right which lasts for fifty years, no person without the consent of the performer can make a sound or visual recording of the performance or broadcast of that performance'[4].

1.2.1 Copyright in electronic environment

Due to the advancement of information technologies, especially the digital technologies, it has become feasible to copy the original work of an author and each copy is as good as the original one. Now, the digital information resources are also made available through internet across the world. These information resources can also be downloaded, stored, displayed or printed and even it can be forwarded to others very easily. 'Internet URLs, email addresses are facts and can be copied. But compilations of URLs or email addresses are protected by copyright, just as internet indexes such as those created by Yahoo, FAQs (frequently asked questions), collection and Usenet newsgroups are copyrighted' [5]. In reality, it is very much difficult to impose copyright law on internet users'. On the other hand, in a networked environment the copyright holders' need to retain control and earn income and the users' right to make use of the material. In most of the copyright violations on internet, the authors may be unaware of it or infringer may be difficult to identify. A strategy for trying to prevent, discourage and detect computer fraud is called counter measure, which depends on, how organizations are run, and whether ethical values are more important or not.

Computer systems may be programmed to help protect themselves from information crime [6], that include:

- System may disconnect the access technology
- System may lock the access terminal keyboard
- System may refuse to accept or process any more data
- System may refuse output sensitive data
- System may notify security officers of the problem
- System security programmes that control data, protection operations are commercially available
- Encryption can be used which is a process of coding data into meaningless information, while it is available to unauthorized users; this is good for online services. 'National Bureau of Standards' in US adopted DES (Data Encryption Standards).
- Legal landmark-LOUSIANA is first step to pass a low specially designed to combat piracy of mass-marketed computer software

2. ROLE OF LIBRARY AND INFORMATION PROFESSIONALS

Today it becomes very much transparent about the issues of IPR, particularly, Copyright, and its related issues, has become critically important due to the awareness and recognition by the institutions and authors concerned on the one hand, and financial and legal implications due to the commercialization of that particular property right. Information managers or librarians come in contact with legal questions everyday of their day-to-day working life. Due to the dramatic change of global scenario especially the advent of information technological products and clientele awareness, information manager should be aware of legal implication relating to copyright. If Any infringement occurs in the library the librarian should take action through court. In order to minimize the risk of financial loss information professionals should take out professional indemnity insurance to avoid financial loss, self service photocopier within the library premises rests with the library staff. In addition as members of the library and information profession involved in the organization of library collection, storage, processing, retrieval and ultimately dissemination of information, it is imperative that we should recognize the implications of copyright in electronic environment and assume responsibility to make our users'

aware of copyright laws and thus ensure compliance and exploitation as and when the occasion demands. Act as a training centre for library and information professionals on copyright matters, bearing in mind the strong likelihood that such professionals on copyright matters, will in future be expected to uphold rights as well as assist users'.

3. CONCLUSION

This paper has tried to cover the different aspects of IPR with special emphasis on copyright issues and the role of librarian and information professionals for guarding the interest of the users such as contributors, authors, designers, performers etc. in the digital information environment. India being a developing country there is no strong IP industry in comparison with the developed countries. So, tougher copyright laws should be enacted in India through legislations. Some believe that copyright has no future in all electronic networked environment, it is not true as because some seek strengthening the law, especially a new 'transmission right' other wise the author or contributors will not get any privilege as recognition for their invention.

Lastly it can be argued that if and when most librarians, users and rights holders are formally educated on what copyright does and doesn't protect, it is likely that the misconception among these groups would no longer prevail and may help to improve access to information. In order to better access digital content for promoting research, the education of what copyright protects and knowledge of the terms and conditions of licensing agreements is necessary. So, librarians and users of digital content should be properly informed of copyright laws and protection mechanisms.

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The Indian National Bibliography in the Digital Age

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Abstract: National Bibliography is considered as a major tool for national bibliographic control. The improvement of national bibliographic control has its own special significance and value within each country. Government of India entrusted Central Reference Library, Kolkata, Govt. of India, Ministry of Culture, to publish the Indian National Bibliography (INB) an authoritative bibliographical record of current Indian publications. The changes in publishing over the last 10 years, which have especially brought a multitude of electronic information resources and the World Wide Web has changed the scope of the national bibliography. To evaluate the importance of the Indian National Bibliography in today's information age, it is important to revisit the genesis, scope and coverage of INB, and the basic principles, which have constituted its traditional strength, and examine the present scenario and how it stands up in this electronic era. In order to make the National Bibliography up to date and comprehensive, recommendations are for the National Bibliographic database and net working of State Central Libraries, since they are the collection centers, and CRL will act as a nodal agency for collecting, editing data and publishing Indian National Bibliography. Soon Indian National Bibliography will be available on both print and electronic format i.e., CD- ROM and online access.

Keywords: National Bibliographic Databases, Digital Era

1. INTRODUCTION

National Bibliography is considered as a major tool for national bibliographic control. The improvement of national bibliographic control has its own special significance and value within each country. Publishers and book sellers, libraries, professional associations, standard institutions, copyright agencies, all can contribute in promoting aspects of National Bibliographic Control. More than 50 years ago the definition of a National Bibliography was: "The ideal (current national) bibliography is conceived as a complete listing of all books, documents, pamphlets, serials and other printed matter published within the bounds of a single country, and within the time limits of the previous year or less". "A current national bibliography is a mirror that reflects the culture of a country. By looking at the current national bibliography one is able to learn about the uniqueness of a country". It can be compared to a mirror which reflects the interests and unique characteristics of a country. National bibliography, in this modern era, is defined as a cumulation of the authoritative and comprehensive records of the national output (i.e., products of the national publishing industry) of a country, published regularly, and with the least possible delay. Government of India entrusted Central Reference Library, Kolkata, Govt. of India, Ministry of Culture, to publish the Indian National Bibliography (INB) an authoritative bibliographical record of current Indian publications. The changes in publishing over the last 10 years, which have especially brought a multitude of electronic information resources and the World Wide Web has changed the scope of the national bibliography. To evaluate the importance of the Indian National Bibliography in today's information age, it is important to revisit the genesis, scope and coverage of INB, and the basic principles, which have constituted its traditional strength, and examine the present scenario and how it stands up in this electronic era.

2. NATIONAL BIBLIOGRAPHIES: THE STATUS

The UNESCO Conference (Paris, 1950) emphasized on the improvement of bibliographic services. It stressed that the national bibliography is not only one list, but a system of bibliographies, that together form a registration of the documents published in a country. In 1977, IFLA and UNESCO organized an International Congress on National bibliographies, which resulted in the publication of "Guidelines for the National Bibliographic Agency and the National Bibliography". In the guidelines the national bibliography is defined as "the cumulation of the authoritative and comprehensive records of the national imprint of a country, published in a printed form (and/or produced in other physical form, such as catalogue cards, machine-readable tapes) regularly, and with least possible delay". The guidelines emphasized that the national bibliography must secure the basic authoritative registration including the authority control of personal names and corporations, and that the registration should be in accordance with the international rules of cataloguing and classification. It also affirmed the acceptance of the concept of Universal Bibliographic Control (UBC), and provided guidelines to support national bibliographic agencies in their work to create standardized national bibliographies. Twenty-one years later, in 1988, the International Conference on National Bibliographic Services (ICNBS) was held in Copenhagen, under the auspices of IFLA. Several recommendations were developed, and many adopted, relating to legal deposit, the coverage, presentation and timeliness of the national bibliography, and the use of international standards. The major outcome of the meeting was the revision of the original UNESCO recommendations from the previous conference.

3. INDIA: NATIONAL COMMISSION FOR BIBLIOGRAPHY

The Indian Government set up an interim commission in 1949 and its first conference was inaugurated in 1954. The culture sub-commission of the national commission recommended the formation of a sub committee for libraries and bibliographies of documents. It also recommended:

- The national commission and the Indian Government should prepare comprehensive lists of outstanding works of arts in India for transmission to UNESCO.
- A national programme of translation of foreign works into Indian languages and of works from one Indian language into another should be formulated and implemented as soon as possible.

The Indian Government took serious initiatives for the development of the bibliographic services, probably influenced by Paris Conference of UNESCO in 1950. In 1954, the Government of India enacted the Delivery of Books [Public Libraries] Act. The Act made it obligatory for the publishers in India to deposit a copy of each book published to the National Library, Calcutta and three other public libraries. The three other public libraries are Connemara Public Library, Madras, Central Library, Bombay and Delhi Public Library. The publishers are supposed to send their copy of publication to these libraries within thirty days from the issue of the publication at their own expenses. The copy deposited in the National Library is passed on to the Central Reference Library, Kolkata for the compilation of the Indian National Bibliography. The Act was amended in the year 1956 so as to include Periodicals and Newspapers.

This Act was a step forward in the direction of bibliographic control of Indian publications. It made it possible to plan the compilation of a comprehensive National Bibliography in thirteen Indian languages, recognized by the Indian Constitution and English.

4. CENTRAL REFERENCE LIBRARY

The Central Reference Library, Calcutta was originally planned to be established as the National Reference Library to be located at Delhi. Since suitable accommodation could not be found in Delhi, the library was temporarily located on the premises of National Library, Calcutta. The responsibility of compiling National Bibliography fell into the hands of the Librarian, National Library, Calcutta. In 1955, the then Ministry of Education appointed a seven member committee headed by late B.S. Kesavan, the first Librarian, National Library of Independent India, Calcutta to make initial plans for a National Bibliography. After a number of meetings the committee laid down general structure under principles, which should govern the compilation of Indian National Bibliography. They are concerned with the coverage, script, classification, cataloguing, periodicity etc. The INB unit started functioning from August 1955 in the premises of National Library Kolkata. Up to 1970 the Librarian of National Library was the Chief Editor of the Indian National Bibliography. In 1970, CRL started to function as a separate subordinate office of the Department of Culture, Govt. of India, headed by a full-fledged Librarian.

5. INDIAN NATIONAL BIBLIOGRAPHY

5.1 Scopes And Coverage

The aim of INB is to publish an accurate and comprehensive bibliographical records of current Indian publications in fourteen Indian languages of India [Assamese, Bengali, English, Gujarati, Hindi, Kannada, Malayalam, Marathi, Oriya, Punjabi, Sanskrit, Tamil, Telugu and Urdu] received at the National Library Calcutta under the provisions of the D.B Act [public libraries], 1954. The following categories of publications are excluded from the bibliography.

a. Maps
b. Musicals scores
c. Periodicals and newspapers
d. Keys and guides to textbooks.
e. Ephemeral materials such as trade catalogues, telephone directories, reports of commercial bodies, publicity pamphlets etc.

5.2 Script And Transliteration

India is a multilingual nation with various scripts. At the beginning stage one of the major problems faced by the INB unit was that of scripts. Dr. Suniti Kumar Chatterjee, a well-known scholar, suggested the roman script with diacritical marks and thus name of authors and titles in Indian languages are transliterated into roman script with diacritical marks wherever necessary. In the case of English books, only Indic authors are transliterated into roman script.

5.3 Experimental Volume Of INB

Before commencing of regular publication, two experimental fascicules, one with the entries arranged according to Dewey Decimal Classification, and the other using Colon classification, were issued and circulated among experts at home and abroad, for opinions and comments. It was published in 1957 using the British National Bibliography as a model. All of the expertise suggestions were incorporated in the first issue of the INB, and so acknowledged in its preface. Finally on independent day, August 15, 1958, the first issue of the INB-covering the last quarter of 1957 was released.

5.4 Periodicity

The first volume of the INB appeared as quarterly with annual cumulations from 1958 to 1963, and its periodicity was changed to monthly in 1964 and continued up to 1977. After a few years, it became irregular. From 1978 and 1979, only annual volumes were published. 1980-81 was published as cumulative volumes in two parts. Since January 1984, the periodicity of this publication became monthly. This continued till 1993. From 1994, monthlies could not be published. June 2000 is the landmark in the history of Indian National Bibliography when its compilation was completely computerized. Up to today, all the monthly issues are being published regularly.

5.5 Arrangement

The Indian National Bibliography is a Classified Bibliography, arranged according to the subject of the document. INB consists of three parts. 1. Classified Part. 2. Author and Title Index. 3. Subject Index. The entries in the Classified Part are arranged according to the Dewey Decimal classification. Under each specific subject, the entries are arranged alphabetically by the names of the authors. If there are two or more works of the same author under a specific subject, the name of the author is not repeated, and the works are arranged alphabetically by their titles.

Sample entry:

843.91[1] –1901 - [2].

France, Anatole[3], 1844 - 1924[4]

Ahankar[5] / translated by Premacand[6]. –Hapur[7]:

Sambhavana Prakashan[8], 2003[9]. – 158p.[10]; 22cm.[11]

Translation of : Thais La revolte des anges.[12]

ISBN 81-86209-40-9[13] Pb.[14] : Rs. 180.00[15]

(H) [16] O122,3M44[17]

Explanation:

[1]Dewey Decimal Classification number; [2]Subject feature; [3]Author; [4]Date of birth and date of death of the Author; [5]Title and subtitle; [6]Translator; [7]Place of publication; [8]Name of publisher; [9]Year of publication; [10]Pagination; [11]Dimension; [12]Notes; [13]International Standard Book Number; [4]Binding; [15]Price; [16]Language Symbol; [17]Colon Classification number.

5.6 Classification & Cataloguing

The 19th edition of Dewey Decimal Classification system is adopted for the Classification of documents included in the INB since Jan. 1988. The corresponding colon Classification number (6th ed) is also assigned at the right hand corner below each entry. Wherever the Dewey Classification is inadequate to express the specific subject the device(1) is added to the DDC number which is nearest to the specific subject. After (1) the name of the specific subject is added as a feature heading. To cope up with the international standards, INB has adopted AACR-2 in UNIMARC format allowing little local variations for cataloguing the document.

5.7 Compatibility With Standard National Bibliography

Characteristics of a national bibliography are that it provides a *current*, *timely*, *comprehensive* and *authoritative* list of all titles published in a country. Let us examine one by one how far INB satisfies the above characteristics.

5.7.1 Current

National Bibliography should provide up to date bibliographic information. In most of the countries, cataloguing in Publication (CIP) records also include in the national bibliography. But in the case of Indian National Bibliography, it is totally depending upon the books received from National Library under the D. B. Act and there is no control over the D. B. Act. Some of the publishers are not at all aware of the Act and some send their books very late to National Library and it takes minimum three months to reach in the Central Reference Library. This will affect the currency of INB. DB Act needs to be amended and is lying unattended in the Ministry of Culture. All the developed nations amended their legal depositary Act so as to include digital materials in their National Bibliographies as per the recommendations of the ICNBS, 1998. So D B Act needs to be changed in its totality.

5.7.2 Timely

National Bibliography should provide information as quickly as possible to the users who need it for collection development, cataloguing purposes and information search. Being a National Bibliographic Agency, CRL has to take necessary steps for the cooperative arrangements with publishers, booksellers for the improvement of timely publication of the INB. Since INB is a Government of India publication INB has to be printed through Government of India press. Although CRL makes camera-ready proof for INB, to get multiple copies CRL has to depend upon the Government of India press. Now Department of Culture granted the permission to print through private press, and every time a fresh permission is needed for printing through private press, and so it affects the timely publication of INB.

5.7.3 Comprehensive

The comprehensiveness of the INB depends mainly on the receipt of the books deposited at the National Library under delivery of books act. There is no effort for the amendment of the act at the government level. The legal deposit legislation needs to be strengthened to make the publishers aware of their obligations, and also include digital materials in INB. Average and comprehensiveness can be determined by the comparison of the content of the National Bibliography with the output of National Publishers over a given period. Here let us compare the average number of records included in INB from 2004-2007 with the data of books published in India as per the Federation of Indian Publishers. The study shows that even 40 % of the total production are not received at the National Library and the DB Act is very poor in our country and it needs immediate remedial measures. CRL should look into this matter seriously. So publishers, distributors and authors should be encouraged to cooperate closely with the library sector. The best way of cooperation is by having the publishing industry create meta-data for the resources that are being published. The metadata should be created by using internationally acceptable standards such as ONIX or DUBLIN CORE.

5.7.4 Authoritative

The National Bibliography is the point of reference for all users, nationally or internationally requiring information about the publication from that country. It should reflect the cultural heritage of the country. INB is the only authoritative bibliographical records of current Indian publications. By authoritative we mean the records of INB are based on the receipts of books at the National Library under the delivery of Book Act.

6. INB: COMPUTERISATION PROJECT

The irregular appearance of INB has reduced its importance and a lot of thought has been put in for the revival of the project. Therefore, in 1998, authorities of the Central Reference Library submitted a proposal for the automation of the compilation of Indian National Bibliography to the Department of Culture, Government of India, and the same was approved without any delay. Department of Culture entrusted the Educational Consultancy Ltd., a Government of India undertaking to advice on the matter. The first computerized INB monthly June 2000 came out using TLMS software. The authority decided to adopt customized version of LibSys IV software for its compilation. Transliteration of Indian language scripts is done through GIST technology of C-DAC, Pune. Customisation of LibSys IV software took more than a year. All the language division enter their data in their respective scripts using C-DAC GIST terminals, and can access the data in other languages also. There were lots of problem in sorting of Indian Language records in Roman script with diacritical marks. Now all the data from 1958 is available on machine-readable format. CRL is publishing Indian National Bibliography regularly with the same system that was installed 10 years back. There is a plan for an for an up-gradation of the system (both hardware and software)

Existing Hardware and Software :

Server : Compaq Prolient 400 – Pentium II

PCs : 7 Compaq DPEP Desktop Pentium II

Nodes : 8 CDAC Gist terminals for multilingual data

Printers – 2 HP laser Jet 2100 & one HP laser jet 4350

UPS : 5 KVA online

Software : Libsys 4 Customised Version.

6.1 Computer Generated INB

All the language divisions enter data on the computer using LibSys software from manually prepared datasheet. If there is any Class number, which does not exist in the Subject Directory, the same has to be added in the subject directory. Next step is generation of INB and taking print out language wise. After proof reading and online editing of data by all language divisions, print out is taken again in all languages together. General editing is done by rotation basis. After the proof reading and on line correction of data, the camera-ready copy of INB is generated. This is then send to press for multiple copies. The same is shown in the flow chart below (fig.1).

6.2 Data Stucture Of Computer Generated INB

In data entry sheet the following fields are to be entered: DDC, Main entry, Title, Statement of responsibility, edition, Publication place, publisher and date, pagination, series, notes, ISBN, binding, price, language, added entries, CC.

Main Entry Area: Personal Name/Corporate Name/ Meeting Name

Title: Title with sub title

Statement of Responsibility area: Contains the information about the translator, compiler, commentator, illustrator, and joint authors.

Pagination: It consists of pagination area, physical description area and dimension.

Pagination- Preliminary pages in roman, total no. of pages and leaves of plates. Physical Description area – ill., charts, fascim, general tables, maps, plans; ports

Dimension – size of the book in cms.

Notes - contains general notes, bibliographical notes, contents notes and original version notes Binding area : Pb./Cb./Lb

Price: Price in Rs./ unpriced.

Added Entry area : See reference entry for translator, compiler, commentator, illustrator, joint authors etc.

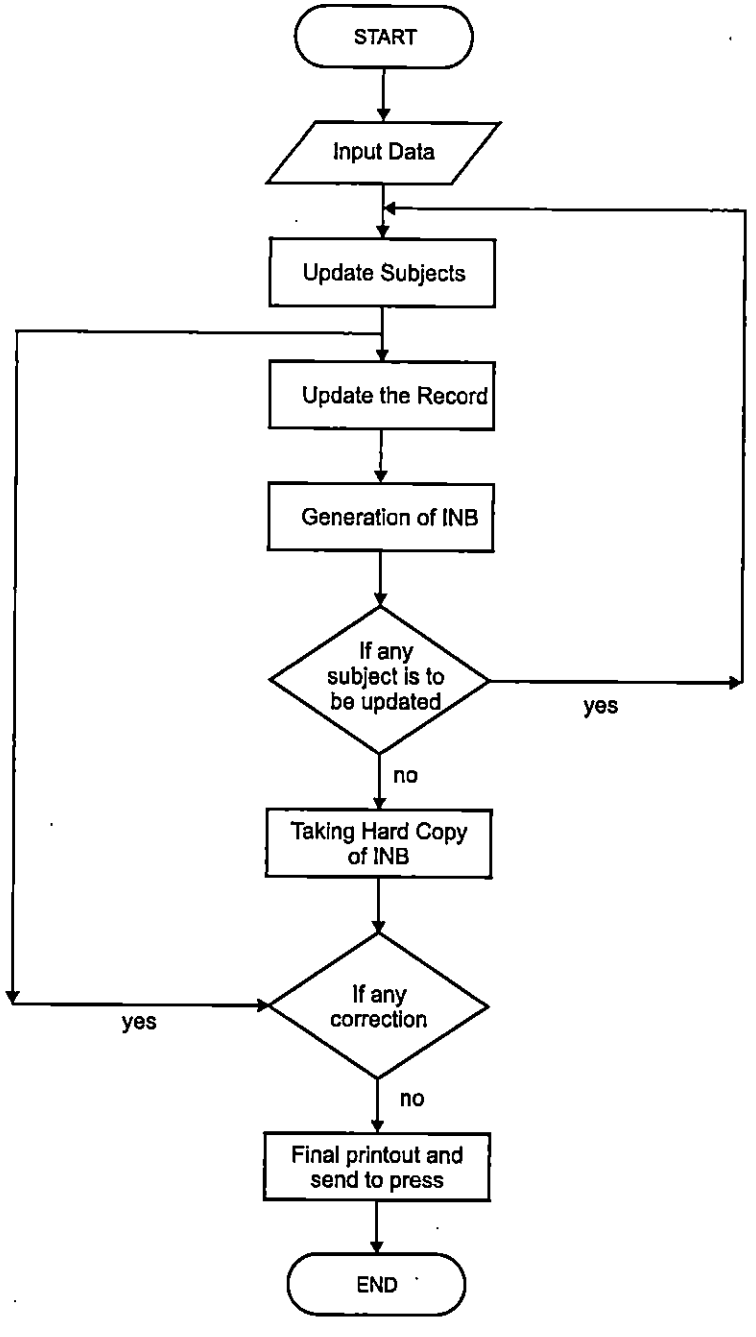


Fig. 1 Flow Chart of the generation procedure of INB

6.3 Computer Generated Inb: Advantages & Future Plan

Before computerization, all the works are to be done manually. All the language divisions enter the data on data sheets and then send for typing. After getting the typed cards (main entry and author and title cards), corresponding language divisions check and correct the typed cards. Then all language divisions merge their main cards in one classified order and author and title cards in alphabetical order. After sectional and general editing, manuscript cards has to be sent to press. But in the case of computer generated INB, computer will automatically generate the classified part and author and title index and it will take hardly 3 minutes. Manually it will take not less than 3 months. Main advantage of computerization is the timely publication of INB. Camera ready copy of monthly and annual volume of INB can be printed here itself. Database can be accessed through author, title & classification number. More than 5 lakhs records are available on CRL database.

On the auspicious occasion of 'Golden Jubilee Year of INB' CRL organized a seminar in collaboration with Connemara Public Library, Chennai on 'DECENTRALISATION OF THE DATA COLLECTION OF SOUTH INDIAN LANGUAGES FOR THE INDIAN NATIONAL BIBLIOGRAPHY' at Chennai on 25th – 26th July 2008. Most of the papers dealt with the inadequacy of D. B. Act and how the D. B. Act can be strengthened by strict implementation and amendment of the act. Also feasibility study of the decentralization of data collection centers, infrastructure for the decentralization, networking of these centers etc were discussed. CRL is planning to have organized such seminar in all over India. CRL will collect data from data centers (State libraries will act as data collection centers) and publish INB. Soon INB will be available on net and the INB database can be accessed online. The search facility of author, title, publisher & classification number will be available on the net. This will be a tremendous achievement for INB.

7. SUGGESTIONS AND CONCLUSION

In most of the countries, digital publications are also included in their National Bibliographies. So Government of India has to take necessary steps for the amendment of D. B. Act. Media can be used for the awareness of the publisher about the importance of D. B. Act. To make comprehensive, current, timely publication of INB, CRL should upgrade the hardware and software system in order to cope up with the present situation. CRL website has to be maintained properly and provide provision for the publisher to input the data of their newly arriving books.

Around the world, national bibliographies are currently available to the users in a variety of formats. A number of countries still publish them in traditional print or on microfiches. New technologies have enabled the development of electronic national bibliographies since the late 1980s. The CD-ROM and the online Web formats provide a greater functionality and an enhanced search capacity to the bibliographic records. An online version can exist as a separate database or it can be part of the national catalogue of a country. ICNBS provides some guidance in respect to the format and design of the national bibliography. The recommendations focus on print publications rather than online products. Now so many discussions are going on about the comprehensiveness of National Bibliographies. Legal deposit act is not adequate in this regard because it has it's own drawbacks. In order to make the National Bibliography up to date and comprehensive, recommendations are for the National Bibliographic database and net working of State Central Libraries, since they are the collection centers, and CRL will act as a nodal agency for collecting, editing data and publishing Indian National Bibliography. Soon Indian National Bibliography will be available on both print and electronic format i.e., CD- ROM and online access.

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A Practical Approach In Developing A Web Portal For Library Professionals: A Web-Based Platform For Knowledge Sharing Through ICT

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Abstract: A library professional who is aware of computer technology, communications Technology, and Information Technology can face the challenges of the new millennium. In practical library administration, most of the librarians have their own innovative ideas, which they would like to share with other colleagues. Developing a web portal is a try to provide a platform to the innovations. Steps of development of this portal, its structure and contents have been discussed in this paper. Efforts of taking this website and its information to library professionals are enumerated further. In conclusion, library professional's response and importance of such type of portals is enunciated.

Keywords: Library Professionals, Librarians, web portal, portal, Maharashtra.

1. INTRODUCTION

Library professionals play an extremely important role in society. Their mission is to provide members of society with access to the information that they need. The introduction of computers was a challenge to all librarians. Like their colleagues everywhere, library professionals in India, particularly those serving high-tech institutions, are already subject to various challenges. Today library professionals are known as information personnel. Present rapid development in communication system and recent innovation in technology witnessed a changing emphasis in the role of information and its management. This changing emphasis necessitates the information professionals to be exposed to the new technologies.

The Association of College and Research Libraries (ACRL), the leading Association in the United States, which has drawn several standards to achieve distinction in academic libraries, has also drawn standards to achieve the academic status. According to ACRL, nine conditions constitute the academic status:

- Librarians are assigned professional responsibilities;
- Librarians have a governance structure similar to other faculties on campus;
- Librarians are eligible for membership in the faculty governing body;
- Librarians have salary scales that are equivalent to academic faculty;
- Librarians are covered by the same tenure policies as other faculty;
- Librarians are promoted through the ranks via a peer review system;
- Librarians are eligible for leaves of absence or sabbaticals;
- Librarians have access to funding for research projects; and
- Librarians have the same protections of academic freedom as other faculty

Based on these conditions, most of academic libraries in the United States recognize the library professionals in the University system at par with teachers in all respects. If we compare the above conditions in Indian context, the library professionals are at equal footings with their academic counterparts.

To cater with the changing needs of the users of library, the library professionals have to develop themselves and get abreast with every innovative services emerging in Library and Information Science field. Hence, It becomes a times need to develop a platform to organize together and help each other. It put forth the idea of developing a web portal for library professionals. It can be a platform to bring all of them at one place to exchange thoughts, innovations, laws etc and help other needy colleague library professionals. Many other important features like providing latest circulars at one place, job opportunities, information about conferences and seminars in the field can be published through this web portal.

2. WEB PORTAL

The term portal is so overused as to be meaningless. In better terms, Lowey defined Web Portal as "A one-stop client-oriented website that personalizes the portals tools and information to the specific needs and characteristics of the person visiting the site, using information from a specific field databases".

Taking some more easily, Web portal can be defined as,

1. A collection of links
2. A collection of services
3. A collection of links and services
4. A collection of applications

3. NEED OF WEB PORTAL FOR LIBRARY PROFESSIONALS

Various library associations all over had taken initiative to keep the library professionals abreast with the latest developments in the field. Fair numbers of associations are being working on national, state, regional level. They arrange conferences, seminars, workshops periodically and invite librarians all over to attend and let them get acquainted with the innovations and other important subjects in the field. They also arrange meetings for the members once or twice to serve the above purpose.

There are also some online forums for librarians from where they can get latest information about the field. Every message from members gets moderated and then being posted on the forum.

A website 'infolibrarian.com' is also available on the net. It is developed as per international standards. It is one of the best website available for librarians in India. But it has some limitations like no information is available on conferences, seminars etc organized on regional level, Limited or less number of job postings for Maharashtra state, No information about Circulars and GR's for working library professionals etc.

Hence, it strikes the need of web portal for library professionals on state level which can provide them the latest information about their field with a regional touch. As the result of which a web portal entitled **Maharashtra Librarians Online Study Circle(MLOSC)** was formed in July 2008 with the slogan "*It is a study circle of the librarians, by the librarians, for the librarians and with the librarians*". An official website www.mlsc.co.nr was developed and commenced. It is a platform to

all the library professionals in Maharashtra to exchange their thoughts, ideas etc. and can get information about what is happening in the LIS field in Maharashtra as well as in the world.

4. AIMS OF MLOSC

The aims for developing MLOSC web portal are as below

a. To develop a platform for the library professionals all over Maharashtra with a regional touch.
b. To bring all of them at one place with an effective use of ICT.
c. To exchange knowledge among all of them.
d. To motivate them to attend seminars, conferences, workshops, symposia not just as a spectator but as an active participant.
e. To make them an active member of MLOSC and to pull out the hidden author from them.

5. OBJECTIVES

The objectives of MLOSC web portal are as below:

a. To communicate and get connected with colleague library professionals.
b. To exchange ideas, thoughts, innovations etc. among them.
c. To learn from experts and to help the novices in the field.
d. To develop a spirit and status-value among the colleague library professionals.
e. To help newcomers as well as working librarians in getting better job opportunities.
f. To provide information to them about any programmes organized in the field.

6. DEVELOPMENT OF MLOSC WEB PORTAL

In the beginning of development, some questions struck in our mind:

1. Will it be possible for all the librarians in Maharashtra to get connected with us through Internet?
   Thanks to UGC, the reply was positive. It is possible because UGC is providing grants to colleges to develop "Network Resource Centre" in their libraries. Provision has been made to pay the Internet charges under this grant. No doubt is there about the unaided colleges as they are self sufficient and most of them have internet connection in their libraries.
2. What exactly we are going to do, a website, a group or a community or something else?
3. If we develop a website, how much will it cost? Can we afford that cost?

After some study and experiments, we got the solutions and we started working on it. The first solution was to develop a website and then attach it to a group and a community. Initially, the budget for developing a website was around Rs 10 Thousand minimum but afterwards gradually it becomes Nil. We plan to develop the site without paying a single penny to anyone.

Following are some of the sources we used to develop the website:

6.1 Microsoft Publisher

This is one of the software available with MSOffice 2007. To develop the pages of the website, we used this software. In this software, it was very easy for us to develop a website. This software automatically converts publisher file developed by it in a website's htm or html format.

6.2 Free Web Space

To upload the website, we opt for free web space available on net. We got it from www.freehostia.com. Prior the selection of freehostia, we go through all the available sites providing free web space and after practical study, and according to our needs, we choose freehostia. We check whether it will allow the htm/html extensions in which we have transferred our site. We get 8 subdomain under the free webhosting package, where we can upload the website.

6.3 Free Domain Name

The domain name provided were too long and not in the website URL format. So, for proper URL address, we search through web whether we get some free URL for our website. We succeed and we get it from co.nr website. We get the needed domain name www.mlsc.co.nr easily from this domain name provider and we link our subdomain on freehostia to the new domain name.

6.4 Free FTP Manager

When the website was designed, there were in all 19 pages and it creates nearly 40-50 different files to constitute our website. It was difficult to upload these files browsing one by one. Hence, we found out freely available FTP manager software from the net and get it downloaded. With the help of this software, we then can upload all our files easily and quickly to the sub-domain file manager.

6.5 Free Linked Files support

After the development and uploading of website, we have to face some post development problems. One of them was the hosting space, that we used, does not allow uploading of files in PDF, word and other similar formats. Hence, we have to find out another solution. We found out a site which provides free uploading and downloading of such files. The name of that website is ziddu.com which provides us space to upload the files.

6.6 Groups and Community

To contact with all the members of MLOSC, so that day to day information about news or events like conference, seminars organized or information about opening of applications for SET/NET exams shall be provided to all at a time was the another important task for us. Hence, we decided to form a google group with the same name i.e. Maharashtra Librarians Online Study Circle through which we can sent mails to all our members at a time. It also helps us to extend member's roles in getting active and post information they come to know.

We also form a orkut community with the same name, but when we come to know that orkut is banned in most of the institutions, we drop the idea of orkut community aside. We just kept it if someone using it can provide us any important information which we can share with all members.

7. WEB DESIGN AND CONTENTS

The design of web portal was designed after discussing and taking guidance from senior expert personnel in the field. The contents and design of the web portal of MLOSC is as shown below:

Sr. No.	Page Title	Description
1	Home Page	The Home page contains a welcome message, News and Events, IE7 download link and link to internal pages.
2	About Us	Contains the message of developers of the website giving the primary information about the website.
3	Members	Contains the Founder Members, Advisory Committee, District coordinators and link to members list present on google groups.
4	Associations	List of Library Professionals Associations in Maharashtra along with the list of Indian and International associations
5	Circulars and GRs	Circulars and GRs relating to library professionals and other important information published by Govt., UGC and Regulatory bodies
6	E-Journals	List of E-Journals for Library and Information Science published all over the world field
7	New Arrivals	List of books on Library and Information Science published in the latest month will be included on this page
8	Research Articles	Research Articles written by Library Professionals on various subjects in the field will be made available on this page.
9	NET SET Exams	Contains information and important links about NET/SET Exams.
10	Job Openings	Contains information about Job openings in the LIS field
11	Open Source Softwares	List of Open source softwares available for Library work
12	Stalwarts in Profession	Information about Dr. S R Ranganathan and Stalwarts in LIS profession in Maharashtra
13	FAQ	Frequently Ask Questions and their solutions
14	Conferences	Information about conferences, seminars, workshops, symposia and other programmes organized in the LIS field
15	Consortia	List of Journals subscribed by libraries in Maharashtra, and which are made available by the members of MLOSC
16	Scholarships and Awards	Information about various scholarships and awards for Library Professionals
17	Membership	Procedure for free Membership
18	Gallery	Pictures of latest events provided by the members will be included on this page
19	Contact Us	Contact emails of the web portal maintainers is available on this page

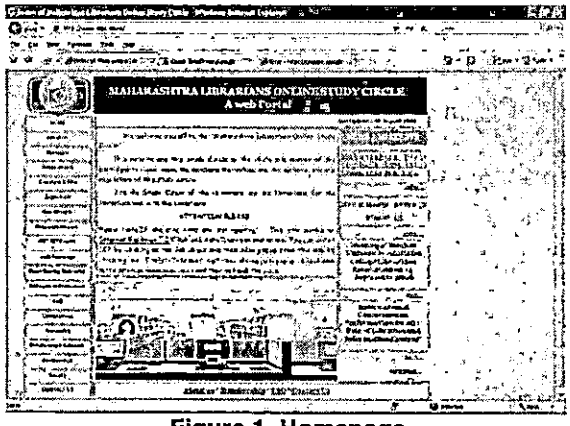


Figure 1. Homepage

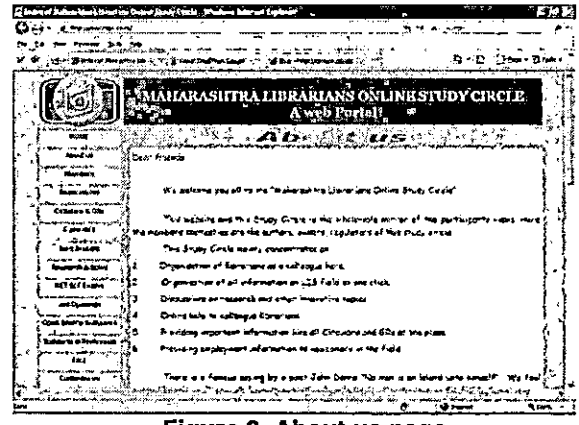


Figure 2. About us page

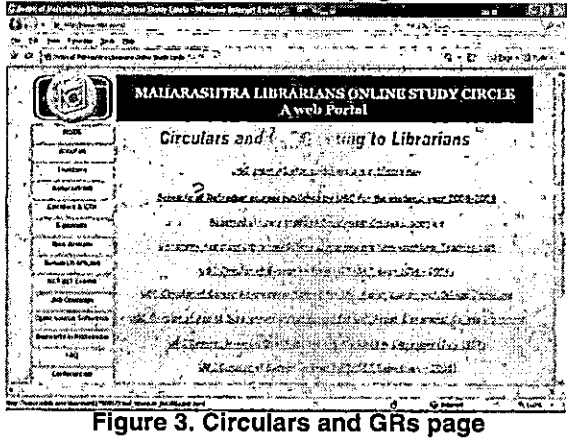


Figure 3. Circulars and GRs page

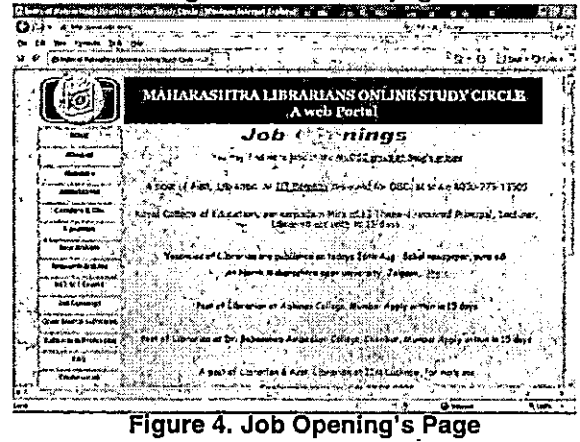


Figure 4. Job Opening's Page

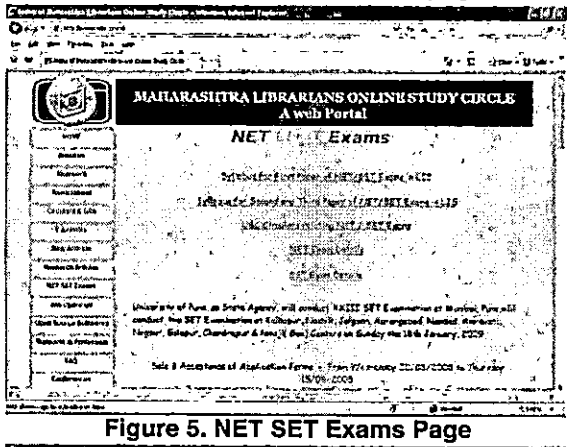


Figure 5. NET SET Exams Page

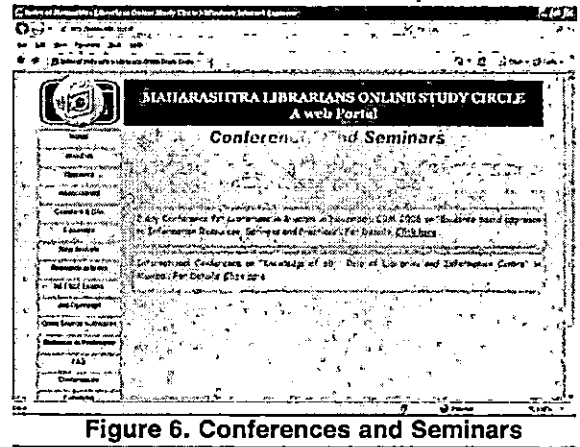


Figure 6. Conferences and Seminars

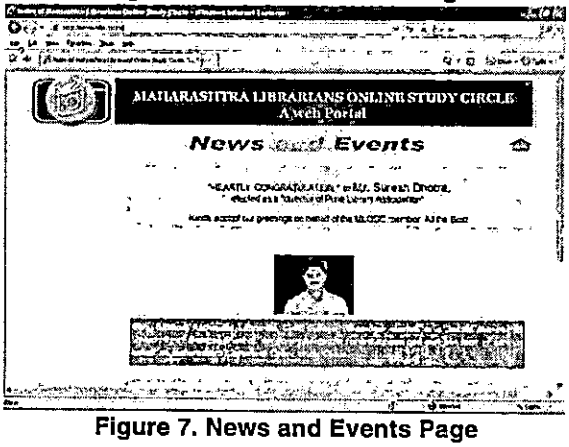


Figure 7. News and Events Page

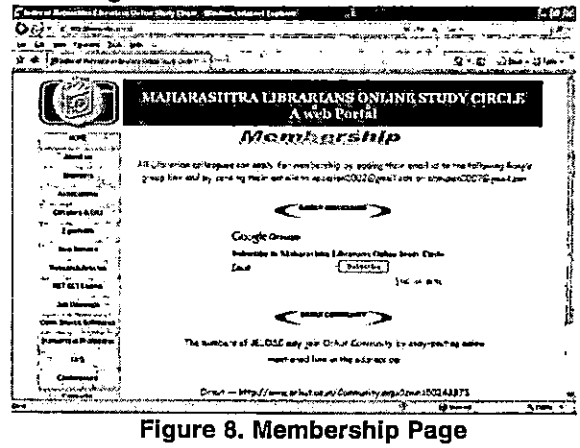


Figure 8. Membership Page

8. REACHING THE LIBRARY PROFESSIONALS AND THEIR RESPONSE

To reach the library professionals and to convince them was the next task. Hence, we started from a conference, which was arranged in Mumbai and from there; we started advertising the MLOSC web portal and request library professionals to join it. We have used following ways to reach the library professionals

1. Direct Personal Relations
2. Through conferences and seminars
3. By phone and mobile
4. Through E-mails
5. Through SMS
6. Through letters

We would like to mention that we used a free SMS service provided by way2sms.com to reach some of our colleague professionals. The earlier response to the web portal was satisfactory and till today, there are 55 Members (within a month) of MLOSC and are increasing gradually every day. Members from all over Maharashtra have joined MLOSC. We have members from Mumbai, Thane, Nasik, Jalgaon, Aurangabad, Pune, Ahmednagar, Amravati, Nagpur etc. and also from rural areas of Maharashtra.

9. CONCLUSION

We are librarians. Our common language is the language of information. Our common community is the community of library users — in schools, universities, public libraries and private industry. Our common work is providing access to information, freely and impartially, to all who seek it. Our common history spans centuries and geography, encompassing everything from Dr, S. R. Ranganathan becomes "Father of Library Science in India" to Librarians got the status of teachers. Our common future includes the Internet and e-books, digital information and wired communities, virtual buildings and global information sharing.

Hence, to conclude, it's a time to come together and help each other in achieving common goals. Creation of MLOSC portal is one of the innovative ways to communicate, get connected and share knowledge with colleague library professionals through the use of ICT. Like Information sharing and Resource sharing, Knowledge sharing will also be a key to success and development of library professionals.

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Consortia: A Media to Foster Resource Sharing and Cooperative Collection Development: Study of the Libraries of Technological Institutes of North India

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1. INTRODUCTION

The concept of resource sharing among libraries is quite old. It emerged to provide wide access and considerably better services to the user community through borrowing and lending of documents from other libraries in formal manner. However, these days the mode of cooperation and sharing of resources has gone under a transformation with introduction of new information technology and growing change over from print based to digital environment. The emergence of Internet, particularly the World Wide Web as a new media of information delivery has led to the proliferation of web based full text online resources. Now almost all the publishers and vendors are using the Internet as a patent way to offer their publications to the community of users' worldwide. The libraries and information centers as heavy consumers of electronic journals and online databases stand to benefit greatly from this technology driven revolution. The high cost of these electronic information products is exerting ever increasing pressure on libraries which in turn are committing larger portions of their budgetary allocation for either procuring or accessing web based online full text search services, CD-ROM products, and online databases. [1]

1.1 Resource sharing - meaning

ALA Glossary defines resources sharing as "A term covering a variety of organizations and activities engaged in jointly by a group of libraries for the purpose of improving services and/or cutting costs. Resource sharing may be established by informal or formal agreement or by contract and may operate locally, nationally or internationally. The resources shared may be document collections, bibliographic data, personnel, planning activities etc". [2]

As said earlier the urge to share other libraries' collections is as old as libraries themselves. In one of her recent papers Kanwal Ameen has said that "the Alexandria library shared its collection with the Pergamum library in 200 B.C." [3] However the idea of resource sharing in express terms is more than a century old when Melvil Dewey (1851-1931) wrote about library cooperation in his writings. An article entitled "Universal library: a plea for placing any desired book within the reach of any person wishing to make reasonable use of the same", published in journal entitled "Public library" in 1905 depicted a picture of what the library networks and digital libraries are attempting to achieve today. [4] The tremendous success of cooperatives like the OCLC is another important milestone in the history of resource sharing. However, the major methods of resource sharing in print era can be summarized as below:

egional cooperation in form of inter-library loan: In the print environment the most used method is entering into inter-library agreement loan for sharing of each other's resources. The service through this method is provided by either sending the documents through mail or a person.

Document Delivery Services: This service is generally available on demand against payment and is given by a central agency. The pioneer in this field in India is National Institute for Science Communication and Information resources (NISCAIR) .

Institutional membership: The third major method of resource sharing is by obtaining the institutional membership of other libraries.

Consortia: Library consortium is the most popular channel of resource sharing these days. As per Oxford English Dictionary [5] "Consortium means temporary cooperation of a number of powers, companies, etc for a common purpose. It is an association of similar type of organizations / institutions who are engaged for producing and servicing the common things / for providing services for a specific purpose of its users..."

Consortia may be formed on a local, regional or international basis; on a functional or format basis or on a subject basis. At present in India two open-ended consortia are functional at national level with a common goal. These are: INDEST consortia which is functional with the aim of catering to the information needs of technical education in India, and UGC-INFONET is there to fulfill the information needs of university education system in India.

1.2 Need and advantages of Resource sharing/collaborative collection development

Laxman Rao has very aptly described the need for consortia. [6]: "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 to serve the needs of users with a view to:

1 Increase the library's access base
2 Avoid unnecessary duplication of materials in a region or group.
3 Multiply library materials purposively within the constraints of a limited budget
4 Facilitate accountability to external agencies
5 To develop specializations locally
6 Enhance the image and prestige of the library
7 Enhance the user base-access from the desktop of the users
8 Place emphasis on access than ownership
9 Benefit the nation as a whole to increase the use of books and information and cut costs

In response to the fragmented and uncoordinated acquisition of library materials the need for collaborative collection development is increasing day by day. [7]

When we think about consortia certain issues come to the forefront. It is quite necessary to discuss these issues in detail:

1 Ownership of stored material is really a controversial issue. If the funding body of the members of consortia is the same then it is not that much a problem. Here the question of access is more important irrespective of the fact of its owner. If all the members of consortia are contributing to

it as a pool then certain issues like ownership, management and preservation, etc. need to be settled well in advance.

2 Selection of items for purchase/subscription is also an important aspect. Generally consortia are formed of institutes of similar nature. In such cases the documents on core subjects or disciplines common to all members of the consortia are purchased /acquired collectively and all documents related to their specific areas of interest are left to them for purchase as per their local requirement.

3 The third important issue that needs to be considered is operational management, and online and physical access. Here a policy is required to be formed regarding:

- The access rights, whether it is single user or multi user and perpetual or for a limited period.
- Whether it is password based or IP authentication based
- Information is downloadable or not.
- Issues related to archiving/ preservation of information both physical and for access

In the end we can say that in the digital environment, collaborative and shared ventures have solved the space problem as being faced in the traditional set up to a large extent.

1.3 Obligations of member libraries in a consortium

For successful functioning of consortia every member library has certain obligations to fulfill. Major responsibilities are detailed below:

1.4 Well-planned collection development

A collective collection development policy should be adopted by the member libraries. While framing such a policy specialisation areas of all the libraries should be well defined to avoid any type of duplication and provision of maximum resources to all members.

In order to reap the benefits of consortia the libraries of Indian Institutes of Technology, National Institutes of Technology, Sant Longowal Institute of Engineering and Technology , Thapar University and Birla Institute of Technology and Science, Pilani have well planned collection development policies specifically with regard to addition of e-resources. The resources subscribed under consortia subscription are finalized after consulting all the libraries. Whenever a new resource is added to the existing ones demand of the majority users is taken into account. Every year the collection development policies of all the libraries are reviewed in order to avoid any type of duplication. MHRD supported institutes are supposed to give certificate to Ministry of Human Resources Development that none of the resources subscribed under consortia subscription is being subscribed in hard copy. It has been found that none of the libraries is subscribing to any of the periodicals available to them through consortia. It is not only being monitored at institute level but by MHRD (Ministry of Human Resources Development) also.

1.5 Development of Union catalogue to provide access through web OPAC

In a consortium the most important liability of all the member libraries is to provide their data holding to the consortium headquarter for compilation of the union catalogue. In any circumstances if it is not possible to compile a union catalogue each library should have its own web OPAC accessible to all member libraries through the library website/webpage. In this regard the libraries studied during the research can be divided into two groups i.e. givers and takers. IIT, Delhi and IIT Roorkee Libraries are the giving libraries. These two libraries along with libraries of other IITs have compiled union catalogues of their periodical holdings and launched it on web for use of the other libraries. As on

12th October, 2008 6327 journals and magazines being subscribed by IITs, IIMs and IIsc have been listed in this union catalogue. Main features of this union catalogue are:

- Users can browse Table of Contents (TOC) of journals of their choice.
- Search facility for articles by author, title, keywords, etc is available
- Users can create their own alerts for getting the TOCs from their favorite journals.
- Provision of sending instant e-mail request in case someone finds an article that is not available in the parent library, but available in another member library.
- INDEST consortium is taking the help of outsourcing for this service. This service is being maintained by Informatics India Pvt. Ltd. The website is <http://jccc-indest.informindia.co.in/
- To ensure optimal utilization of this union catalogue 'Case studies' and 'Tutorial' to learn and effectively use it have been given on the consortia website.

Libraries of other fifteen libraries are not a party to this union catalogue; however they are enjoying the benefits of the union catalogue of IITs. Both these premier institutes are also providing document delivery service to the libraries of other government institutes free of charges.

1.6 Networking of the member libraries and availability of intranet

Inter-library networking and a very strong communication system is the core of a successful resource sharing programme or consortium. Due importance to this aspect as well as to the infrastructure required to access should be given by all libraries. All the libraries surveyed except for the libraries of CT Institute of Management and Information Technology, Jalandhar, and Shaheed Bhagat Singh College of Engineering and Technology, Ferozepur have internet connections in the libraries and the libraries are connected to the institutes through intranet. The users of these libraries are able to access the resources and Web OPAC of other libraries.

1.7 Information literacy and training of library staff

To make resource sharing more effective and useful for the readers all member libraries should arrange for the training of their staff in the use of latest devices of IT. User orientation and information literacy regarding the services and source available for them is equally important to ensure optimal utilization of the consortium and network resources. It has been found that proper attention is not being given to information literacy of library users and training of library staff in the use and operation of digital collections in many of the libraries in India. On inquiring from the librarians of the libraries it has been found that the libraries of IIT Delhi and IIT Roorkee are organizing regular information literacy programmes. NIT Kurukshetra and NIT Jalandhar had also arranged one such programme but it is not a regular activity. Other libraries have not given due importance to this important aspect. The attendance of librarians at the INDEST annual meet and workshop is also coming down every year. Many a time it is found that institutes depute faculty members for this meet instead of the librarian, which does not serve the purpose. In a recent INDEST-AICTE Consortium workshop and annual conference a faculty member from NIT Hamirpur represented her Institute.

1.8 Special consideration to weaker libraries

There is no doubt that in the present era of competition the trend of marketing of information is attracting the attention of everybody but still most of the users consider the libraries as service institute only. In view of it, it becomes the moral duty of the stronger libraries to give special consideration to provide services to libraries, which do not have many financial resources. A very good example is of the JCCC- J Gate custom Contents for Consortia. Under this service union catalogue of the periodical

holdings of the libraries of IIT Delhi and IIT Roorkee is available for the users of other level one members of INDEST. (jccc-indest.informindia.co.in)

2. MAJOR TRENDS IN CONSORTIA SUBSCRIPTIONS

These days consortia are the main platforms for resource sharing. Following are the major trends prevalent in consortia subscriptions:

2.1 Group or Aggregated subscriptions

E-journals are the major source being subscribed under the consortia subscriptions. In most of the libraries subscriptions are not for single or individual journal, but subscriptions are for aggregations of journals.

- This type of subscription is generally cheaper than individual journals.
- Subscription cost and subscription processing efforts are also comparatively less.
- Some bonuses are also available with group subscription.

Some problems are also associated with group subscriptions:

- The publishers or a central agency decides the formation of groups or aggregates, and it is not necessary that all the journals in an aggregate will be of use to all the libraries in a consortium.

Most of the technical libraries are members' of one or the other consortium. All consortia subscriptions like IEL online, ASME, ASCE, ACM are the aggregate subscription. Decisions for forming the aggregates are taken at some central level.

2.2 Trial Access

There is lot of competition in the IT sector. All the publishers are adopting various types of strategies to get business and the most popular of these is the provision of trial access to various types of online publications to promote their sale. During 2007 Central library of IIT Delhi subscribed to 25000 e-books after watching their trial access. Trial of 500 e-books from Elsevier Science publishers was provided to NIT Jalandhar (November 1st- 30th, 2007) through their regular website http://www.sciencdirect.com. These days trial access to Management and library science collection of Emerald publishers was provided to NIT Jalandhar (August 15th-September 14th, 2008). This is happening in all institute of repute in India.

2.3 Resource Sharing: Indian initiatives

When we trace the history of resource sharing in India we are able to classify resource-sharing activities in four major groups:

- Establishment of NISSAT and NIC

  NISSAT was established in 1977 with the support of National Committee on Science and Technology, Council for Scientific and Industrial Research (CSIR) and UNESCO. Aim was to facilitate provision of information for the advancement of research and academics.
- Document Delivery Services (DDL) of NISCAIR (formerly Known as INSDOC). NISCAIR formed with the merger of INSDOC and NISCOM is providing document delivery services to academician of the country against nominal charges
- Interlibrary cooperation in the form of ILL and institutional library membership, etc.
- Another form of resource sharing which is popular these days is obtaining the institutional membership of big libraries.

2.4 Library consortia

In India the concept of library consortia started emerging with the birth of library networks some of which are enlisted below:

- CALIBNET (Kolkota Librray Network)
- DELNET (Developing Library Network)
- INFLIBNET (Information and Library Network)
- ADINET (Ahmedabad Library Network)
- PUNENET (Pune Library Network)
- BONET (Bombay Library Network) [8]
- MALIBNET (Madras Libraries Network)

After the above mentioned scattered efforts in this direction and a strong feeling that a consortium is required for technical education system in India, the Ministry of Human Resources Development), Government of India appointed an expert group to discuss in detail this issue with the publishers and evolve a working model for execution of a consortium for technical education. In this way INDEST was formed and it commenced its operation in December-2002 with Dr Jagdish Arora as its first coordinator. At present the following consortia in an organized form are functional in academic circles in India:

- INDEST- Indian National Digital Library in Science and Technology sponsored by Ministry of Human resources Development, Government of India offering consortium access to important full text journals published by major international publishers. It started its operation in December, 2002. The operational area of INDEST has been widened with the inclusion AICTE sponsored Institutions and name has also been changed to INDEST-AICTE consortium. http://indest.iitd.ac.in
- CSIR consortium sponsored by CSIR for providing access to Elsevier journals to CSRI laboratories http://202.54.99.7/ejournal/ejournalhome1.htm
- UGC-INFONET for providing access to e-journals to the readership of the universities under UGC. This consortium started functioning w.e.f January 2004. www.inflibnet.ac.in/info/ugcinfonet
- Forum for Resource Sharing in Astronomy and Astrophysics (FORSA). A cooperative venture by a group of Libraries for providing access to select number of journals in the field of Astronomy and Astrophysics. www.library.yale.edu/consortia/FORSA.html
- IIMs consortium. A cooperative venture for providing access to a select number of journals in the field of management. IIM consortium was formed in 2000 after long deliberations among the Directors, and librarians of IIMs and publishers of selected e-resources.[9]
- The National Informatics Center in Delhi is maintaining a portal of Government of India to provide administrative data for planning and governance. Website. http://home.nic.in [10]
- Latest in this series are :
- HELINET- Health Science Library and Information Network is the first medical library consortium in India initiated by Rajiv Gandhi University of Health Sciences (RGUHS), Karnataka. www.rguhs.ac.in/HELINETHOSTCONSORTIIM/homeholinethost.htm
- Nano Science and Technology consortium (NSTC) http://wwwnstc.in Here only INDEST-AICTE and UGC-Infonet consortium will be discussed in detail, as these are the consortia which took birth to serve the Indian universities and technical education and are quite functional in the real sense.

3. INDEST-AICTE CONSORTIUM

INDEST-AICTE consortia first came into existence in 2002 under the name of INDEST consortium, which later in 2006, with the entry of AICTE sponsored Institutions, became INDEST-AICTE Consortium. Thirty-seven centrally funded government Institutions including IITs, IISc Bangalore, NITs. IIITs and IIMs are core members of INDEST consortia as on 12th October, 2008. The Ministry provides funds required for providing differential access to electronic resources subscribed for the Consortia thorough the consortium headquarters set up at IIT Delhi. (http://indest.iitd.ac.in).

The benefit of consortia based subscription to electronic resources is not confined to 37 major technological institutes (Comprising of IITs and NITs) in the country, but is also extended to all educational Institutes under its open-ended proposition. As on 11.10.2008 INDEST comprised of 773 members consisting of core members, AICTE supported members and self supported institutes.

INDEST has been able to attract the best possible price and terms of agreement from publishers. The consortium subscribes to over 6500 e-journals from a number of publishers and aggregators. The INDEST-AICTE website hosts a search interface to locate these journals and their URLs as well as their alphabetical list. < http://indest.iitd.ac.in >

3.1 Objectives of INDEST

The INDEST-AICTE consortium has the following objectives: to subscribe electronic resources for the members of Consortia at highly discounted rates of subscription and at the best terms and conditions;

- to extend the benefits of consortia based subscription beyond the core members to other engineering and technological institutions;
- to impart training to users and librarians of member institutions on subscribed electronic resources with the aim to optimize the usages of electronic resources;
- to find more avenues of cooperation and interaction among member libraries;
- to increase interaction among member institutions; and
- to increase scientific productivity of member institutions in terms of quality and quantity.

3.2 Major activities of INDEST-AICTE consortium

Major activities of the INDEST-AICTE consortium are as follows: Available at < http:// indest.iitd.ac.in

- To arrange subscription to identified electronic resources for member institutions;
- Identification and subscription of new resources;
- Interaction with of member libraries to ensure optimal utilization of subscribed electronic resources;
- Organise training programmes for the member Institutes on use of Electronic resources;
- Initiate additional activities complementary to the present activities of the consortium and;
- Encourage interaction amongst member libraries.

Membership:

The consortium has the following three types of members:

Core member Institutions:

As on October 11th, 2008 thirty seven centrally funded Government institution including IITs, IISc, NITs, IIITs, IIMs, ISM, SLIET, NERIST and NITIE are core members of the INDEST.

Members with financial support:

The INDEST-AICTE consortium has enrolled sixty additional members with financial support from the All India Council of Technical Education (as on 11th October, 2008)

Self supported Engineering Colleges and Institutions

The consortium being an open ended platform, invites AICTE accredited and UGC affiliated institutions to join hands with the leading engineering and technological institutions in India and share the benefits it offers in terms of lower subscription rates and better terms of agreement with the publishers. More than 676 (as on 11th October, 2008) engineering colleges and institutions have already joined the consortium under this proposition.

Governance

The Consortium operates through its Headquarter set-up at the IIT Delhi. The Ministry of Human Resource Development (MHRD) provides funds required for:

- Subscription to electronic resources for 37 core members including IISc, IITs, NITs, and other institutions; and
- For operation of the consortium.

The consortium headquarter functions under a National Steering Committee (NSC) for inter-institutional coordination and for taking decisions on policy issues under the overall policy direction of the Government of India. The NSC consists of members from amongst the beneficiary institutions and functions under the chairmanship of the Director IIT, and Chairman AICTE as its co-chairman. The Ministry has also set-up a National Review Committee (NRC) for the INDEST-AICTE Consortium. The National Review Committee is responsible for overall policy, monitoring and coordination with UGC and AICTE and promoting the activities of the Consortium. The NRC functions under the Chairmanship of Joint Secretary, Technical Education, Government of India.

3.3 Membership of INDEST- AICTE consortium

On the basis of core subject areas core members have been divided into different groups / categories as detailed below:

- Group 1: IITs and IISc
- Group 2: NITs, ISM, SLIET and NERIST
- Group 3: IIITM Gawalior and IIIT Allahabed
- Group 4: IIMs, IIITM and NITIE

All other members subscribe the e-resources of their choice as per the availability of funds and requirements.

3.4 Benefits of the collaborative efforts to the institutes

Members of the consortia have witnessed the following benefits of joining consortia:

Saving due to considerable decline in print journal subscription:

During the survey it has been found that major portion (75-80%) of the library budgets of all the libraries was being spent on journal subscription. Consortia subscription has solved this problem to a large extent. All institutes have reported saving of a considerable amount due to collaborative subscriptions. All the three NIT's surveyed have reported the yearly saving between 8-10 lac rupees.

A solution to the storage problem:

Problem of storage space has been solved to a great extent. E-journals have stopped the piling up of bulky back volumes. These are now available in e-format. All the publisher of e-journals have provided archival access to their publications from the very first issue with the exception of a few journals.

Saving of human resources:

Under consortia subscriptions digital resources are made available to a large group of reader from a central place. It leads to a great saving of human resources also. Subscription to print journals is a universally troublesome job. It involves a lot of time, effort and problems in their acquisition and display. E- journals have solved this vexing problem

Usage of e-resources: a comparative evaluation of the status of libraries surveyed:

It has been found that INDEST has evolved usage monitoring mechanism called E-resource Access Management System for MHRD sponsored institutes, but the usage status of self supported and state government run colleges and institutes is not being monitored centrally.

Ministry of Human Resources Development is spending huge amount for providing access to e-resources to IITs, IIMs and NITs (total 37 institutes as on 11th October, 2008) but on reviewing their usage statistics (available at the consortium website < http://indest.iitd.ac.in >) a new type of divide which can be very well named as e-resource usage divide has been observed. This divide is between the usage of e-resources between the IITs and NITS and other institutes of NIT status like SLIET and Thapar University, etc. From the usage statistics of six major institutions following facts have been gathered:

- Usage of Science Direct (a multidisciplinary aggregation) is 11700 and 260964 downloads (average for the last six months i.e. January-June, 2008) per month at NIT Jalandhar and IIT Delhi respectively. Whereas the annual subscription amount for both the institutions is same.
- The rate of downloads is affecting the per article cost of the same, e.g., NIT Jalandhar due to very low usage of ScienceDirect has paid Rs. 47/- per article during the period January-June, 2008 where as the average cost of the same article for IIT, Delhi is Rs 2/- only because of the very high usage of Science Direct at IIT Delhi. The situation is even worse in case of journals of ASCE. For one article of the same, on an average, IIT Delhi paid Rs.5/-, IIT Roorkee paid Rs.6/-, NIT Hamirpur paid Rs.169/- SLIET paid Rs.3923/- and so on. Similar is the situation with other e-resources.
- When inquired from the librarians and users regarding such a low usage, it was informed that users at these institutes are not used to use e-resources. Some are of the view that the research culture at IITs is at a very advanced stage, whereas at NITs it is not at advanced stage. Lack of information literacy is also an important reason for low usage of e-resources.
- It has been observed that the institutes where the usage of e-resources is low have started the regular Post Graduate and Doctorate level courses very recently. It is expected that the usage will increase with the growth of research there.

Global collection development is another solution to resource sharing and has the potential to remove all types of digital divide and bringing the academic community of the globe at one platform. During the International Conference on Digital Libraries, 2006 some of the very important recommendations for information management to ensure global access to information were made [12];

- Enactment of Digital Library Act in India.
- Establishment of consortia for content creation.
- Democratisation of information.
- Capacity and capability building in digital library
- Formation of National Digital Library Policy
- Launching of Digital India Initiative (Dii 2006)

These recommendations if put into practice can act as milestone in the management and global access to digital collections. Similar recommendations have been made by the National Knowledge Commission in its report of 2007[13]. <www.knowledgecommission.gov.org >

The commission has proposed to the Government of India to formulate strategies in LIS sector with regard:

- To set up a national commission on libraries.
- To prepare a national census of all libraries.
- To revamp LIS education, training and research facilities.
- To reassess staffing of libraries.
- To set up a central library fund.
- To modernize library services and management
- Encourage greater community participation in library management.
- To promote information and communication technology application in all libraries.
- To facilitate donations and maintenance of private collections.
- To encourage public private partnership in LIS development.

We are eagerly waiting for the government to give practical shape to these proposals.

3.5 INDEST vis-à-vis libraries surveyed : user's perspective

There is no doubt that INDEST has made a large number of e-resources available to the users of the libraries surveyed. In the beginning all the concerned were very excited about this facility. Slowly and slowly mixed reactions, both negative and positive, have started coming. A large number of users were interviewed and their reactions can be summed up as below:

- Use of paper has increased instead of decreasing. Earlier users used to come to library and study the required articles from the journals and note down the required information but now the readers have been found taking print outs of each and every article as it is not possible to read even one article at a stretch from the computer screen. It is very much visible from the usage statistics of the users of these libraries.
- As the journals are available in aggregates users of all the libraries expressed that hardly 60% of the information is relevant to their needs, and rest of the information is not relevant to their requirement.
- The usage of the resources is low in comparison to the subscription cost.
- Once the aggregates are decided, access to the same continues for years without any periodic review. Members are not even consulted for their views on inclusion or exclusion of any resources.

3.6 User's views about and problems in resource sharing

The major channel of resource sharing among the libraries surveyed is the access to e-resources through INDEST consortium. INDEST consortium has two segments of e-resources for its member libraries:

- First is the availability of e-journals from major publishers and aggregators of the world;
- Second is the JCCC, J-Gate Custom Contents for Consortia. It comprises of the bibliographic database of the periodical holdings of IITs and IIMs. In this IITs and IIMs are the contributing institutes, whereas the NITs and other similar status institutes are the receiving libraries. This is the major platform of resources sharing among these institutes.

With regard to these two the problems being faced by the users are detailed below:

- From the resources available it is a feeling among the librarians of all the three government engineering colleges in Punjab and their users that the central government is giving a step motherly treatment to the state government run engineering colleges. The expenditures for the central government run institutes is being met from the central pool, whereas the state government run institutes are paying independently for the resources being accessed by them. Consequently there is wide divide among these three categories. *If the Indian government is really interested in promoting ICT and the libraries it should at least in the initial phase bring all libraries at par.*
- Very often the users of these libraries are found visiting the IITs and NITs to have access to those resources, which are not available to them. Though against copyright rules yet it is going on everywhere.
- It has also been observed that the hardware to access these resources is only available to the users of IITs and NITs. Even in these libraries the users always report the shortage of printing facility. In state run and private colleges adequate infrastructure is not available.
- The users of almost all libraries also find lack of publicity of library services.
- Many users have reported the prevalance of politics in our education system, and our libraries are no exception to it. Many faculty members are reporting from time to time that heads of their departments do not forward their requirements to library for purchase. Their research requirements are also not taken care due to personal reasons

4. CONCLUSION

The major aspect to be strengthened in making resource sharing successful is the type of commitment to the process. Information and communication technologies have enabled our libraries to improve on resource sharing. It is now possible to instantly connect worldwide. Users are now in a position to initiate their own inter-library loan and they need not proceed through the libraries. However, it is the personal and political issues as always, which determine whether or not resource sharing will succeed. Many publishers are able to exert political pressure to get their resources added in the consortia subscriptions and many a time librarians are also governed by such considerations. In such cases the actual requirement is always sacrificed for requirement driven by personal interests. Real resource sharing demands shared values, vision and commitment, as well as a good political situation, special funding and full participation by all the stakeholders. [14] Most of the members of a consortium may belong to different parent institutes with different administrative setups and rules, so the administration of a network/ consortium is not an easy task. It needs lot of efforts on part of the

members as well as the nodal agency, if any. However, consortia subscriptions or purchase of e-documents are the most common channel of resource sharing these days. In view of the popularity of the trend of globalization in all spheres of life social, economic, political and academic resource sharing or the trend of consortia purchases and subscription will flourish more. The two major consortia i.e. INDEST- AICTE consortia and UGC-INFONET, both being open ended consortia (a consortia which is open for participation and membership to all types of libraries- public, academic, special etc.), have brought about a revolution in the field of resource sharing. The unending responsibilities of our libraries are collection development, preservation and retrieval and dissemination of information. In view of the flood of e-information, formation of consortium and integrating intellectual access to ensure maximum utilization of the resources at a reduced cost, time and space is the need of the hour. But the librarians at many times are found short of time to do justice to all these activities. It ultimately affects the functioning, and utilization of the resources. In August 2007 Dr Jagdish Arora, Librarian IIT Delhi and the National Coordinator of INDEST-AICTE consortium left the consortium to join a higher post of INFLIBNET Director. It is a very sorry state of affairs that till date new National Coordinator has not been designated. If this situation continues it can affect the working of the consortium. With the introduction of many multidisciplinary courses in the member institutes the utilization of consortium resources is expected to increase, so it requires a permanent and active managing body. Any venture to be successful needs continuous support, supervision and periodic reviewing. To make resource sharing a success in India all this must be ensured.

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Document Supply Service for Effective Resource Sharing: A Case Study of Tata Institute of Social Sciences, Mumbai

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Abstract: The growth of the literature in an exponential manner has created a situation where no library is self sufficient. With universities initiating new academic programmes, number of students increasing, it has become difficult for libraries to meet the growing information needs of clientele. In such a scenario, it is the interlending and Document delivery services that help libraries in winning over this situation. This article explains the reasons for interlending and document supply services and how TISS is utilizing this service to achieve the maximum satisfaction of its clientele. The primary purpose of this paper is to outline findings of Inter Library Loan and Document Delivery Service provided to users in TISS for the period 2002-2008. The findings are primarily based on the database maintained at library. This article reiterates the fact that interlending and document delivery still continues to be the best practice at libraries for achieving the resource sharing among participating libraries.

1. INTRODUCTION

Library being a service-oriented organization, intend to meet the information requirements of the users. It provides various kinds of services such as current awareness service, selective dissemination of information, translation service, photocopying service, document delivery service etc. Interlending & Document delivery service plays an important role in the dissemination of information in any library. Interlending & Document Delivery Supply is a service that obtains copies of journal articles and the loan of books for research and reference purpose. Items available through Inter Lending & Document Delivery include books, journal articles, conference proceedings, annual reports, DVD's etc. Journals articles are usually supplied in photocopy or electronic format.

2. NEED FOR INTERLENDING DOCUMENT DELIVERY SERVICE

Document delivery service becomes a necessity in case of libraries which aim to give better service to its users by providing efficient access to information. Users' expectations and demand grow constantly. Library should be able to provide them with as wide an array of information as possible. Because of the inability of being self-sufficient, libraries have to co-operate between them via interlibrary loan, with document supply centres or commercial document supply centres.

The shared use of individual library collections is a necessary element of resource sharing among libraries. Just as no library can be self-sufficient in meeting all the information needs of its users, so no one can be self-sufficient. The supply of loans and copies between libraries in different libraries is a valuable and necessary part of the document delivery process. The reasons why resource sharing is becoming significant day by day is mainly due to:

1 Increasing cost of documents
2 Tremendous growth of literature
3 Declining library budget

4 Reduction in operational cost of libraries
5 Technological solutions
6 User need satisfaction
7 Optimum utilization of existing resources
8 Out of print books
9 Rare Books

3. IMPORTANCE OF NETWORKED ENVIRONMENT

The concept of networking resource sharing among libraries emanated basically from growing realization to minimise the expenditure and maximise the use with the networks, sharing of information resources through several ways like online access to catalogues, co-operative acquisition of printed and electronic information resources, online access to union catalogue.

4. REVIEW OF LITERATURE

An attempt has been made to review the selected literature on use of interlibrary loan and document delivery services. For this purpose, a retrospective search of literature on the above facets was done on online databases like LISA, Emerald and the available library science journals in the institute. Naidu, G and Gunjal S.R. (2002)[1] studied the interlibrary loan service with special reference to Indian agricultural libraries. This study examines what types of documents were borrowed and lent, what were libraries' responses. These also helped authors to measure the popularity of inter library loan service among these libraries.

McFarland[2] describes a project using chemical Abstracts Document Delivery Service carried out by the Chemistry Library of Washington Universities Libraries where a comparative analysis of nine commercial document delivery vendors was carried out. Documents were compared on cost, expected and actual time of delivery, reliability, efficiency and vendor responsiveness. Harer [3] points out that user have acquired increased information identification and access but that delays at the delivery end can still bring frustration. He highlighted the need for enhanced information delivery to keep pace with technological developments in access and verification.

As channels of information exchange move from one type of items such as books and journals to databases and electronic journals, the costs keep increasing and are related to actual use. Bierman [4] describes costs and charges, some libraries pay for ILL access out of their operating budget, others subsidise the service and charge the user a flat rate fee for each request while others charge the actual cost of providing the service. On the same lines, Janke [5] conducted a survey about the ways of accessing technical information like rules and standards. This kind of specific information requests have several unique problems, one being that they are not usually published via the book trade or lent out by libraries.

Coming to the problems of providing document delivery service using electronic resources, a study by Racine[6] describes in detail some problems of electronic full text journals in academic libraries. Author points out that where electronic full text is concerned the humanities and social sciences could well miss out because the money driving development is in other disciplines. This article also shows the necessity to inform users of the time coverage of electronic journals and the need to inform them of which journals has electronic text available. Libraries will have to annotate their on-line catalogues

accordingly. Nevertheless this article advocates state electronic text centers, as a form of co-operative collection, without the problems of transporting material, which apply to no-electronic material.

5. OBJECTIVES OF THE STUDY

a) To know the magnitude of interlending services received by and given by TISS

b) To find the number of document delivery cases transacted from and to TISS

c) To project the trend of interlending and DDS for future.

The prime objective of any library is to meet the information requirements of its clients most effectively. To meet this objective, the library builds collection of learning resources in a planned manner and offers a variety of information services to inform the users what is available in their areas of interest. All these services generate requests from the users for the original documents (Xia and Lei)[7]. The service that supplies the required documents to the user on demand is known as document delivery service. This case study has the primary objective of studying the usage of inter lending and document delivery service by different users like faculty, research scholars and students at Sir Dorabji Tata memorial Library, Tata Institute of Social Sciences, Mumbai.

6. INTERLENDING AND DOCUMENT DELIVERY SERVICE AT TISS

Sir Dorabji Tata Memorial Library at TISS, as on date is having a collection of over 1,08,000 books and journal bound volumes. Being a premier institute in the area of social sciences and social work, library consistently makes a serous effort to build the collection to meet all the requirements of the course programmes being offered at the institute. Realizing that at times it is becoming increasingly difficult to meet the needs of users, library opted for inter library and lending services. Currently, library has this resource sharing arrangement with over 9 major institutes/universities and also has a membership for the DELNET services, thereby enhancing its reach for getting inter library loans.

Presently, library has the following components for offering its Inter library and interlending service.

1 Use of Web OPAC

2 Document ordering

3 Automatic Document Delivery

4 Regular Delivery of pre-specified documents

5 Electronic mail

6 Transfer of documents between participants and participating libraries

6.1 Libraries participating in the Interlending and document Supply service

The academic staff like faculty, project staff and research scholars are the heavily used users of this service at TISS. This service is also extended to students who are working towards their assignments, dissertations and day to day classroom consultations. Interlending and document supply service is one of the services the library offers to the teaching staff, Research Scholars and students of the institute to their teaching and research. Members of the teaching staff and research scholars are the heaviest users of this service. The following libraries are approached for offering the interlending and document supply service.

1 Indira Gandhi Institute for Development Research, Mumbai

2 International Institute for Population Studies, Mumbai
3 Indian Institute of Technology, Mumbai
4 British Council Library, Mumbai
5 American Resource Centre, Mumbai
6 Mumbai University, Mumbai
7 SNDT, Women's University, Mumbai
8 Nirmala Niketan, College of Social Work, Mumbai
9 National Institute of Industrial Engineering, Mumbai
10 Developing Library Networks, (DELNET) New Delhi
11 Other Libraries

6.2 Interlending and Document Supply Requests

It is evident from the Table-1 that Number of users requesting for Interlending and document supply services has been increasing consistently except 2005 and 2007 the number of requests is less.

Table No.1: Interlending and Document Supply Requests

Year January-December	Total Number of loan requested received	Total Number of loan requested satisfied of which	%
2002	88	64	72.72
2003	168	148	88.09
2004	190	160	84.21
2005	120	99	82.50
2006	214	184	85.98
2007	170	155	91.17

However, success rate of library in meeting those requests has been consistently upward. In the year 2006, 214 requests are recived out of which 184 requests are fulfilled. And in 2004, 190 requests were received, out of which 160 were fulfilled. In the year 2007, 170 requests were received, out of which 155 were fulfilled.

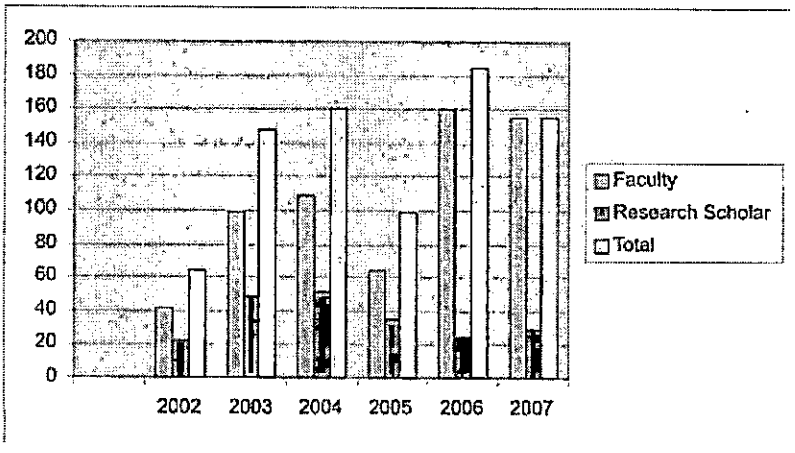


Fig. 1: Inter-lending and Document Delivery provided to different users During April-December 2002- 2007

It is evident from the figure 1 that most of the faculty and research scholars utilisied document delivery service, in the year 2006, 184 documents utilisied followed by 2004, 160 documents, 2007, 155 documents, 2003, 148 docments, 2005, 99 documents and 2002, 64 documents.

6.3 Interlending and Document Supply provided to other libraries

The Figure 2 indicates that TISS library also provided Interlending and Document Delivery services to participating libraries in an equal manner. The figure shows that in 2002-03, there were 121 requests from other libraries and this loan request number grew to 190 documents in the year 2007-08.

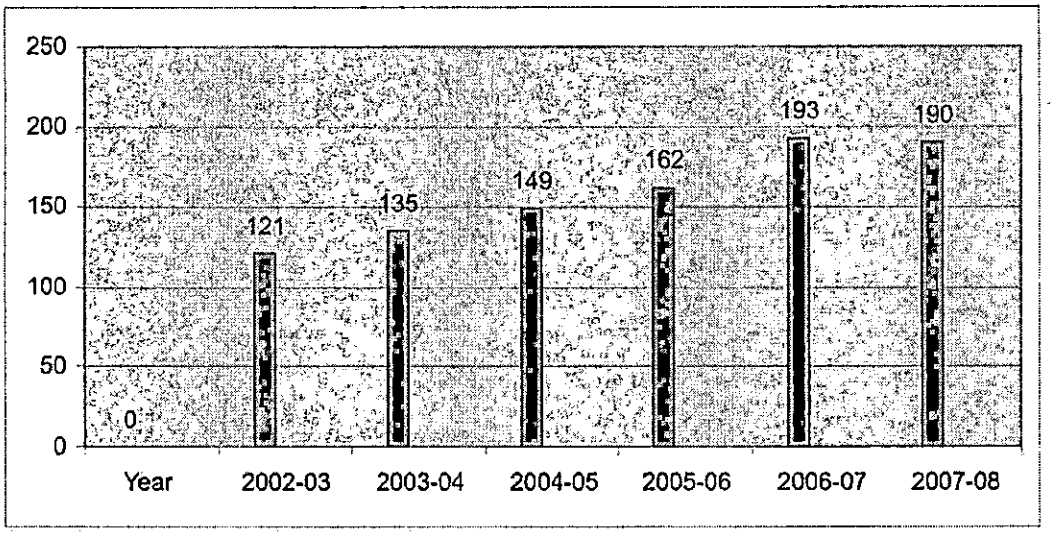


Fig. 2: Interlending and Document Delivery provided to other libraries

This healthy and balanced growth in the number of borrowings and the lending indicates that resource sharing by inter lending is a mutually beneficial process where the users of all participating libraries get benefited.

6.4 Number of articles procured using Interlending and Document Supply

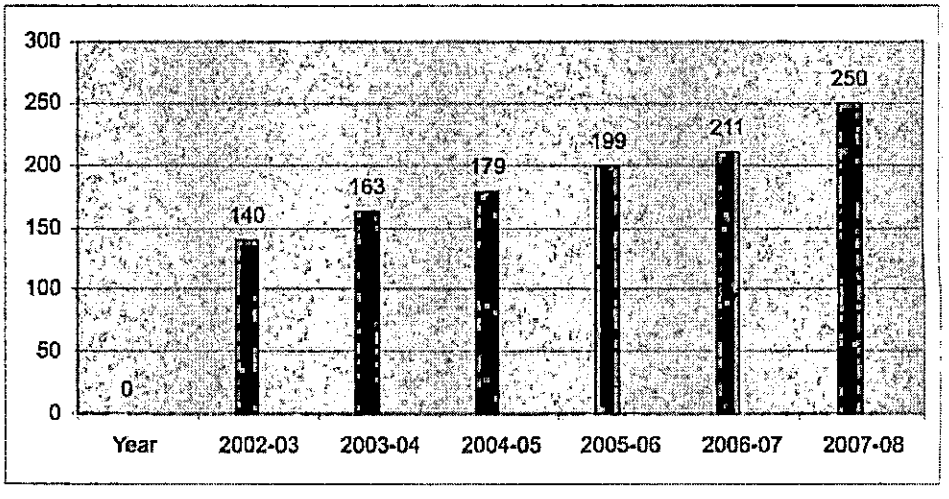


Fig. 3: No of Articles Delivered from Document Delivery Service

Journal articles also form a major portion of the documents being requested under Interlending service. Figure 3 shows the number of articles procured by TISS Library under lending service. IN 2002-03, the number of articles procured was 140. This has seen an increase and in year 2007-08, library procured more than 250 articles from different libraries for the benefit of its users

7. THE ROLE OF INFLIBNET-JCCC

INFLIBNET has initiated interlibrary loans and document delivery services from the comprehensive collection of subscribed 7500 full text journals under JCCC@UGC-INFONET. INFLIBNET has designated 22 libraries to fulfill ILL request from the users, affiliated to 149 universities covered under UGC. The ILL libraries together subscirbe for 2000 plus journals that is not available through consortia, Universities can request for articles from the journal holdings of these libraries wherever they find useful articles in JCCC search, that are not avilable in that library.

8. FINDINGS AND SUGGESTIONS

In this case study the authors have taken into consideration the information needs of the users like faculty, research scholars and students, their requests for the document delivery services and the library's ability in successfully meting those interlending requests. The data was collected, analyzed and examined in detail to understand the profile of document delivery and interlending services at TISS library. Inferences were drawn from the analysis of the data. Subsequently, following findings have been evolved.

1 That the number of requests for inter library loans has seen a consistent increase. This indicates that it is really essential for libraries, no matter how resourceful, to depend upon inter library loans to met its users' demands.

2 TISS library has a creditable success rate (in the range of 80%) as far as procuring the documents requested under inter lending and document delivery service.

3 Journal articles continue to be significant items which are requested under documents delivery service along with books.

4 TISS library has also honoured considerable number of requests that it received from other libraries. This number of loans is comparable to what TISS library receives under inter lending service. This indicates that, this is a mutually beneficial resource sharing process to engage in inter lending services

5 There is need for regional libraries network services in Mumbai.

9. CONCLUSION

Libraries have realized the importance of Inter lending and document supply and hence are maintaining this service even in this digital environment. There are some difficulties in physical delivery of documents, but these have to be worked out. The financial constraints of libraries indicate that they have to be more cost-effective in inter-lending and document supply services (Jean)[8]. It would be interesting to see what role the inter lending and document supply services will play in the libraries profile of services (Senchal) [9].

Running a service like interlending and document supply service involves dedicated staff and commitment towards users' satisfaction. Having dedicated staff and the commitment of library

administrators, TISS library will continue to keep the trend of scaling up their services of interlending and document delivery.

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E-Journals and Resource Sharing Through Consortia

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1. PRELUDE

Journals are one of the most important media for scholarly communication. Scientists and researchers have many kinds of forums and media for communication about their research. They include seminars, conferences, symposia, workshops, publishing books, reports, monographs, articles in journals, papers in conference proceedings and so on. However, researches have shown that scientists/ researchers depend on or prefer more journals than any other form of information sources. (King and Tenopir, 2000). There has been an economic crisis in scholarly publishing since late 1980's due to spiraling costs of scientific journals (Hanghton, 2001; Johnson, 2000 ; Odlysko, 1997). Libraries were the first to experience the effects of this crisis as they struggled to keep up with the exploding volume and escalating cost of Journals. Data collected by the Association of Research Libraries (ARL) USA, reveals that the unit cost paid by research libraries for serials increased by 226 percent between 1986 and 2000 as against 57% increase in the consumer price index over the same time period. As the unit cost of journals in major disciplines soared, libraries were forced to cancel large number of journal subscriptions.

2. ELECTRONIC JOURNALS (E-JOURNALS)

The culmination of advances in printing and publishing technology, information storage media, information & communication technology (ICT) and networking resulted electronic publishing during 1970's and further refinement there after. This not only reduced the cost of publishing but increased the speed of publications exponentially apart from providing many more advantages over print resources.

There are two major types of electronic publishing viz-electronic journals (e-journals) and electronic books (e-books). E-journals are serial publications available in digital format. Rich and Rabine define e-journals as "a periodical literature that is made available as an individual title via electronic medium, typically the world wide web" (Rich and Rabine, 2001). Electronic Journals can be electronic journals only or electronic equivalent of print version. Kling and Mckim (1997) distinguished e-journals into four kinds, viz.,-

Pure Electronic Journals - Journals whose text is originally distributed only in digital form;

Electronic Print Journals – Journals primarily distributed electronically, but may have very limited distribution in paper form;

Print Electronic Journals – Journals Primarily distributed in paper form, but are also distributed in electronic form;

Print + Electronic Journals – Journals that are initiated with parallel paper and electronic editions that may be widely distributed.

3. GROWTH OF E-JOURNAL PUBLISHING

Henry Oldenberg produced the first issue of a scientific journal "The philosophical Transactions of the Royal Society of London" in 1665 (Schaffner, 1994). In 2001, Ulrich's Periodicals Directory listed over 160,000 periodicals and serials published throughout the world. This list apart from journals includes the proceedings of annual conferences and annual reviews. None the less, the number of scientific journals and abstract journals published world-wide is estimated to be 1,00,000 and the number of journals has grown steadily and rapidly during the second half of the 20th Century (Tinopir and King, 2000).

The first electronic journals appeared during 1970s. until 1990 their number was rather small. They were not available to a large number of users; and this is one of the reasons why they were not wide spread (Tinopir and King 2000). But then, their number started rising. With the appearance of Internet and PCs during 1990's the number of electronic journals rapidly grew (Hitchcock, et al, 1996). The studies carried on by Okerson (Okerson, 2000) and documentation made by the Association of Research Libraries, USA (Association of Research Libraries, 1997) show upsurge in the number of e-journals published after 1990. The table given below shows the growth of e-journals from the appearance of the first e- journal in 1970's.

Table 1: Growth of e-journals

Sl.No.	*Year*	*No. of e-journals*
1	1070's	First e-Journal appeared
2.	1991	27
3.	1993	45
4.	1994	181
5.	1995	306
6.	1996	1,093
7.	1997	2,459
8.	2000	4,200
9.	2006	13,000
10.	2008	20,000

4. FORMATS OF E-JOURNALS

One of the important issues in e-journals publishing is format of publishing. While traditional format of print journals on paper is relatively limited, there are many more possibilities in electronic environment. The most important digital formats are: PDF and HTML. Other format include : ASCII, Post Script, SGML, XML, RTF, Excel, MS Word, Word Perfect, Tex, La Tex, Real Page etc.,

5. A HISTORICAL VIEW OF LIBRARY CONSORTIA

'Library consortia' refers to co-operation, co-ordination and collaboration between, and amongst libraries for the purpose of sharing information resources. A review on the literature shows that 'library consortia' is not a new concept, although libraries were not used it widely until about 1980s. The main driving forces for collaboration among libraries especially academic libraries were increase in publications or information explosion, the rise in the cost of publications along with the decline in

library budgets. Increase in the students enrolment and increasing demand for library services and collections were other factors 1980s onwards (Baathuli Nfila and Darko-Ampen, 2002).

Historically, the common form of library co-operation was the sharing of union catalogue information, storage facilities, collection development, and human resources at local, regional and national and levels in the United States (Payne, 1998). Later, these services expanded to others. In the ten-year period from 1980-1990 many libraries in the 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 can be considered as a possible reason to move toward library consortia in 1980s (Baathuli Nfila nad Darko-Ampem, 2002).

Creation of the Internet in 1990s imposed new challenges for libraries. In the print era, libraries used to buy resources and own it; copyright law allowed for fair use in ways that advance education, study and scholarship. In the electronic era, use of information recourses goes under contract law and licenses. Libraries become involved in several partnerships when a license is created. Electronic publishing also brought possibilities for resources sharing in many ways.

6. LIBRARY CONSORTIA IN DEVELOPED COUNTRIES

Consortia activities which began long before among libraries increased and integrated in fine tune with advances in information and communication technologies. Co-operative and collaborative efforts have grown from a peripheral and limited positions of resources sharing to an integrated system-wide resources sharing in recent years in the West. Within USA, there are now well over 100 large library consortia. Some of the most established ones are :Washington Research Library Consortium (WRLC), International the Coalition of Library Consortia (ICOLC) Ohio Link, Georgia's Galileo, Virginia's VIVA, Pennsylvania Academic Library Consortium (PALCI) etc.,

The WRLC (Washington Research Library Consortium) founded in 1987 by some of the major Universities in Washington D. C., comprises of seven universities. It provides access to online catalogue, electronic journals, article databases and digital collections. It promotes co-operative storage facility. Ohio-Link (Ohio Library and Information Network) is a consortia of Ohio College and University libraries and the State Library of Ohio. Serving more than 600,000 students, faculty and staff at 85 institutions Ohio Link emphasizes sharing of electronic resources, and in particular shared digital multimedia. Georgia's GALILEO stands for Georgia Library Learning Online. It is an initiative of the Board of Regents of the University system of Georgia. Over 100 databases, 2000 full text journals, encyclopedias, business directories and government publications are accessed through GALILIO. Virginia's VIVA (Virtual Library of Virginia) is the consortium of the nonprofit academic libraries within the Commonwealth of Virginia. Its members include: 39 state assisted colleges and universities, 32 private non-profit institutions, and the Library of Virginia. VIVA affairs more than 160 databases 5600 full text journals, news papers as well as nearly 10,000 full text of poetry, verse drama and over 750,000 full text scholarly materials. PALCI (Pennsylvania Academic Library Consortium) formed in 1996 is a federation of 35 academic libraries. It offers a virtual union catalogue and a system for client initiated loans. It works to source discount on electronic databases. North West Academic Libraries (NOWAL) is a consortium of all libraries in the UK universities and colleges in Cheshire, Cambria, Greater Manchester, Lancashire and Merseyside.

7. LIBRARY CONSORTIA IN DEVELOPING COUNTRIES

While library consortia are originated in the Western countries, some developing countries have been active in such efforts and have benefited from the advantages of consortia. In Thailand, there are two existing networks (THAILINET, a network of online catalogues of academic libraries in the Bangkok region, and PULINET, the grouping of provincial academic libraries) have now joined forces to from ThaiLIS, which is the backbone of a national resource-sharing system. The China Academic Library and Information System (CALIS) lunched in the first half of 2000 is a nation-wide academic library consortium which links services across the provinces and cities in China. Consortium of Academic Libraries of Catalonia (CBUC) is a consortium of the state-funded universities and the State Library of Catalonia (Spain) acting as a channel for cooperation. The digital library of Catalonia has been sharing electronic resources among all the member libraries of the consortium. The Gauteng and Environs Library Consortium (GAELIC) is the largest academic library consortium in South Africa.

8. INTERNATIONAL LIBRARY CONSORTIA EFFORTS

The Regional University and Science Library Advanced Network (RUSLANet) in North-West of Russia is creating common information space of libraries and integrating with worldwide library information space. International Coalition of Library consortia (ICOLC) comprising of library consortia in the United States, Canada, The United Kingdom, the Netherlands, Germany, Israel, Australia and many other countries is a cooperative venture at international level. The Coalition represents over 5000 member libraries worldwide and serves primarily higher education institutions by facilitating discussions among its members on issues of common interest. *Electronic Information for Libraries,* known as eIFL.net, is an independent foundation that negotiates and advocates for the wide availability of electronic resources by library users in transition and developing countries. Its main focus is on negotiating affordable subscriptions to electronic journals for libraries in the education and research sectors, while supporting emerging national library consortia in member countries. The two primary activities of eIFL.net are the creation and support of library consortia in transition and developing countries and assistance in the provision of access to electronic resources. Over the years other program areas have been added. eIFL.net began in 1999 as an initiative of the Open Society Institute (OSI). In the 1990s, OSI made significant investment in library development and modernization in the countries of its network, especially in the post socialist countries of Central and Eastern Europe as well as the former Soviet Union. In 2002, eIFL.net became an independent foundation with diversified funding registered in the Netherlands with its operational seat in Rome, Italy. eIFL.net is a member of the International Federation of Library Associations and Institutions (IFLA) and the International Coalition of Library Consortia (ICOLC). Its current members include : Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Cambodia, Cameroon, China, Croatia, Egypt, Estonia, Ghana, Georgua, Iran, Lesotho, Jordan, Kyrgyzstan, Laos, Latvia, Lebanon, Lithuania, Macedonia, Malawi, Mali, Moldova, Mozambique, Nigeria, Palestine (Gaza and West Bank), Poland, Russia, Senegal, Serbia, Slovakia, Slovenia, South Africa, Sudan, Swaziland, Syria, Tajikistan, Uganda, Ukraine, Uzbekistan, Zambia, Zimbabwe. Many other countries have expressed their interest to join this international consortia. Members express their commitment by paying a membership fee to eIFL.net and devoting their own extensive voluntary effort to manage their consortium. Sustainability of access to information is ensured by country covering the cost of subscriptions to the tune of nearly $ 7 millions. The mission of eIFL.net to foster access to electronic resources makes it a natural partner for the Open Access movement. The aim of the program is to provide training and knowledge sharing

on Open Access across the eIFL.net community. At the same time, eIFL.net encourages greater visibility of locally produced content in eIFL.net member countries through the establishment of institutional repositories at leading research institutions within the library consortia.

9. LIBRARY CONSORTIA IN INDIA

India is a vast country with large higher education system. Today there are more than 400 universities, and over 18000 colleges providing higher education to more than 7.8 million pupil. The number of teachers engaged in teaching and research in various institutions & universities is 3.1 million. Apart from research carried out in universities, there are many R & D institutions devoted to research in specific areas. Efforts have been made in India by libraries and Government agencies like UGC, AICTE, CSIR etc., to initiate network based consortia to facilitate information to this huge population of scholars, teachers and students. Though there exist in India many consortia at different levels, prominent among them are: UGC - INFONET, INDEST, FORSA, CSIR Consortium and HELENET.

9.1 UGC-INFONET e-Journals Consortium

The Government of India, through University Grants Commission (UGC) initiated UGC-INFONET e-journals Consortium to provide scholarly access to electronic journals and databases by the research and academic community throughout the country. This consortium was launched on the concluding day of University Grant Commission's Golden Jubilee Celebrations by His Excellency, The President of India, Dr. APJ Abdul Kalam on 28th December 2003. This initiative is a great boon to academics and scholars in the country.

The main features of the UGC - INFONET are:

- It has Scaleable Architecture to grow from University to affiliated colleges.
- Nation-wide Terrestrial Backbone using Fiber Optic Links
- Integrated Satellite WAN supporting broadband and STPC VSAT technology
- Comprehensive Network Management Systems for overall monitoring of the network, down to each and every device.
- Linkage with other academic and research networks all over the world.
- Data security and virus protection using firewalls and Intrusion Detection Systems.
- Dedicated Data Center for Web hosting, e-journals and Mail Boxes
- Mirror sites spread all over the country for content hosting
- Broadband Multimedia and Video Channels for Distance Learning.

The UGC-InfoNet e-journals consortium is wholly funded by the UGC and is monitored by Information and Library Network (INFLIBNET) Centre, Ahmadabad. INFLIBNET acts as a coordinating and monitoring agency and liaisons between UGC, Education and Research Network (ERNET) and all universities in the country.

The consortium provides access to nearly 9000 full text scholarly electronic journals from more than 25 publishers across the globe. It provides current as well archival access to core and peer-reviewed journals in different disciplines, such as., arts and humanities, social sciences, physical and chemical sciences, life sciences, earth sciences, mathematics, statistics, computer science etc. So for, 100 universities out of 171 universities, which come under the perview of the UGC have been provided access to these e-journals & this facility will be extended gradually to other universities and affiliated colleges. In 2008, UGC decided to adopt JCCC (j- Gate Custom Content for Consortia) for all

universities it has extended Info Net facility. JCCC is a customized access solution for both electronic and print journals subscribed by Indian Universities and UGC- InfoNet's e-journals consortium under the aegis of INFLIBNET.

9.2 INDEST Consortium

The Ministry of Human Resources Development, Government of India has set up Indian National Digital Library in Science and Technology (INDEST) consortium. The consortium subscribes to full text electronic journals and bibliographic databases to 38 leading engineering and technological institutions. The Ministry of Human Resources Development (MHRD) provides funds for the consortium. The All India Council for Technical Education (AICTE) also contributes to this consortia project for purchase of e-resources. The members of core group of institutions are as follows: IITs and Indian Institute of Science (IISc) (8), National Institute of Technologies (NITs), Indian School of Mines (ISM), Sant Harchand Singh Longowal Central Institute of Engineering and Technology, Sangrur (SLIET) and North Eastern Regional Institute of Science & Technology (NERIST) (20), Indian Institute of Information Technology (IIIT) and Indian Institute of Information Technology and Management (IIITM) (2), Indian Institute of Management (IIMs) and National Institute of Training and Industrial Engineering (NITIE) (7). The policy of the consortium, being an open-affiliated institutions to join hands and share the benefits it offers in terms of lower subscription rates and better terms of agreement with the publishers, a few other core members of the INDEST Consortium are AICTE-supported Members (63) and Self-supported Institutions (382). The consortium subscribes to more than 6,500 full text journals and seven databases from various publishers and aggregators. The consortium negotiates the prices with the publishers to get more discounts.

9.3 CSIR Consortium

The Council of Scientific and Industrial Research (CSIR), one of the largest government-funded organizations in India established in 1942, has 43 national laboratories carrying out research and development work in the areas of Engineering, Biological, Chemical, Physical, Environmental and Information Sciences. It has an estimated 5,000 active researchers supported by approximately 16,000 technical and administrative staff. As support services, these laboratories have established libraries and documentation centers on their premises. In the year 2001 CSIR consortium was formed, basically to provide access to electronic journals for forty-three centers. The major objective of CSIR Consortium is to strengthen CSIR library resources by pooling, sharing, and providing electronic access to scholars and scientific circles of CSIR, NISCAIR(National Institute of Science Communication and Information Resources) is the nodal organization for developing a Consortium for CSIR laboratories for accessing e-journals. Targeted to access over 4,500 journals, this consortium has entered into an agreement with many publishers, such as., Elsevier Science, American Chemical Society, American Institute of Physics, and Springer. Attempts have been made to make available the J-Gate Custom Contents for Consortia (JCCC) to all laboratories.

9.4 HELINET Consortium

HELINET (Health Library and Information Network) established by Rajiv Gandhi University of Health Sciences (RGUHS), Bangalores is a consortium on a cooperative access model in Health Sciences and related areas. The consortium subscribes to 09 databases, 709 full text journals from 200 + publishers and several e-books, Clinics and Year books. Archival access for 5-10 years has been made available. The collection represents all major health science disciplines- medical, nursing, pharmacy, dental, etc. J-Gate@HELINET, the Customized e-journals gateway for searching and

finding articles from over a million articles available through HELINET has been created to facilitate single point access to all these journals.

10. CONCLUSION

Electronic journal publishing, particularly after the birth of Internet has revolutionized the information world and more so library environment. Consortia, as collaborative effort, in general are tailored to meet the unique needs of their members Consortia purchasing projects have become a basic tool that expand collections and support co-operative technological development for libraries. The creation of the Web and networks brought many possibilities for integrating consortia activities both in developed and developing countries. The library consortia are shifting from a peripheral and limited position of resource sharing to an integrated system-wide resources sharing in recent years. India has been active in consortia activities. UGC-InfoNet e-journals Consortium, INDEST, FORSA, CSIR Consortium, HELENET etc. are facilitating access to thousands of journals and have proved to be boon to academic and research community in the country.

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Establishment of Networking and Sharing of Resources in Consortia Environment

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Abstract: In the digital age, it becomes both a challenging issue and an opportunity for libraries to provide electronic resources in networked environment. With networking technology of Internet it is possible to form any number of logical networks using the Net as the backbone. Library and information system networking in India have come into existence more than two decade ago. By utilizing the support of the regional and national level networking, libraries in India should corporately establish library consortia for offering and shared electronic resources. Many libraries like technical libraries have their own network existing within their own locations. These networks can be expanded to enhance the access to the information resources through collaborative partnerships, in the form consortia.

Keywords: Consortia models, UGC Infonet, FORSA, CSIR, INDEST, HELINET, Salient features

1. INTRODUCTION

Much important is given to research and development activities in India. Hence, there has been a voluminous growth of published documents in the recent past. The increasing cost of information resources, technological advancements that offer newer methods of information processing, retrieval and dissemination are some of the factors which have made partnership a necessary and which led to the formation of e-journal consortium. The development of the consortium is the outcome of the desire for resource sharing.

The explosion of information and inadequate library urged the libraries to adopt new philosophies and technologies for collection development and reduce the costs information. Information technology is currently taking center stage. The enormous advantages it has in easing the delivery of information around the world, as well as the central role of information in the new global economy, means that information technology will shape the dynamics of the new millennium.

The proliferation of electronic resources and ever changing information technology has become a challenging task for the library professionals. Since last few decades, there has been tremendous change in the area of library cooperation and resource sharing has become the hallmark of libraries for cooperation, coordination and collaboration.

2. LIBRARY NETWORK

The national commission of libraries and information Science (NCLIS) in its national program document defines a library network as "two or more libraries/ or other organization engaged in a common pattern of information exchange, in a common pattern of information exchange, through communications, for some functional purpose. A network usually consists of a forma; arrangement whereby organizations are available to all potential users. Libraries may be in different jurisdictions but agree to serve one another on the same basis, as each serves its own constituents. Computers and telecommunications may be among the tools used for facilitating communication among them".

There are some key problems associated in the establishment of library networks in India:

- Enforcing the standards in data conversion among the libraries who create their databases independently
- Unequal utilization of the database since members of the network vary in their size
- Inadequate library training program to create the expertise in database development
- Exorbitant cost involved in creating and maintaining the databases in terms of software and hardware for joining the network
- Non-supportive attitude from the management of the institutions, to support the network activity.

3. MEANING OF CONSORTIA

The term consortia has been defined as "Cooperative arrangement among groups or institutions or libraries".

According to oxford English dictionary, Consortium means temporary co-operation of a number of powers, companies etc. for a common purpose. It is an association of similar type of organizations/ institutions who are engaged for producing and servicing the common things for providing services for a specific purpose of its users. In the context of library, consortium is a community (co-operate) of two or more information agencies that have formally agreed to coordinate, cooperate in or consolidates certain functions to achieve mutual objectives. It is a joint venture of any group of libraries to fulfill the common goal. Consortia may be formed on a local, regional, national international basis; on a functional or format basis; or on a subject basis. Majority of the libraries particularly in developing countries are thinking today about the cooperative purchasing for any group of libraries, consortia should be formed and are often useful for establishing a formal structure regarding resource sharing with formal agreement for each participant library. In this method of cooperative collection development of each and every participant library can easily access to specific collections.

A consortium is said to be "a cooperative arrangement among group institutions or an association or society". Consortia are commonly formed to increase the purchasing power of the collaborating institutions to expand the resource availability and to offer automated services.

3.1 Objectives

- Increase the cost benefit per subscription
- Promote the rational use of funds
- Ensure the continuous subscription to the periodicals subscribed
- Guarantee local storage of the information acquired for continuous use by present and future users
- Develop technical capabilities of the staff in operating and using electronic publication databases
- Strategic alliance with institutions that have common interest resulting
  - Reduced information cost
  - Improved resource sharing

3.2 Types Of Consortia

- No single model for consortia

- Varies form highly decentralized organizations to highly centralized ones.
- The degree of centralization of consortium is the primary factor affecting not only how member institution interact each other, but also relationship with external party (Publisher/ vendor)
- More decentralized the consortium, the greater the degree of autonomy each member retains
- Correlation between the amount of autonomy that the individual institution retains and the ability of the consortium to achieve set of goals as a group.
- If the authority is highly centralized, the consortium is more likely to have dedicated staff to perform ongoing work.

3.3 Reasons for Consortia Approach

- increased international cooperation;
- Proliferation of e-information sources/sharing existing sources;
- Emerging new technological tools-developments in network associated with electronic delivery, electronic journals and variety of web based facilities that provide access to wide range of other databases,
- New information products and services;
- Increase in user's skill in search of information;
- Economic competition and information access and delivery, focusing more on electronic resources using leverage of a group and common funding sources

3.4 Consortia Models

Consortia models are not well defined and vary depending upon types of libraries participating, parent organizations they belong to, subject areas they cover, purpose of coming together and so on. Consortia could be a club of highly decentralized or highly centralized organizations. The characteristics of consortia model are also influenced by other players like publishers and vendors. Highly decentralized models suffer due to non availability of common agenda, no external funds, central sponsor and central staff. On the other hand, highly centralized models overcome these lacunae and also get maximum discounts.

4. E-JOURNALS PRICING MODELS IN OPERATION

Unfortunately, as of now there are no universally acceptable pricing and licensing models for e-journals. Current pricing models for e-information, which are developing during a period of experimentation, are not sustainable. Although it can not be generalized the learned society publishers are increasingly prepares to make all their non subscribed journals available to consortia in return for a relatively small extra payment.

5. HOW DO LIBRARY CONSORTIA WORK

5.1 Loosely Knit Federation

The loosely knit federation is typically a local or regional consortium formed at the grass root level. This is more a federation than a consortium. It is governed by its member libraries, and usually has no central staff or any central funding. It is very flexible and has low overhead, but it also generates a low level of return. While these consortia involve little risk or investment of time, it is difficult for

them to achieve all but the simplest of outcomes. With perhaps few common interests, and no central authority, there is only limited or no group purchasing power. With little agreement on electronic resources to purchase, request to publishers and other information providers yield minimal return.

5.2 Multi-Type/Multi-state Network

The multi-type/multi-state network usually has the value of a central staff, but even if sub organized by type of library there is a purely voluntary level of corporation among members who have little common interest. Vendors generally provide the poorest database discounts because the network cannot guarantee a specified level of participation. The programmatic agenda of the consortium is likely to be highly fragmented.

5.3 Tightly Knit federation

At the next level, the tightly knit consortium has some of the flexibility of the loosely knit federation, but is not encumbered by the fragmentation of membership of the multi-state, multi- type consortia. Tightly knit federation may have a sponsoring agency, and may have either a focused membership profile or heterogeneous profile. Some dedicated staff coordinates program development, but does not control that program. The organization may rely solely upon institutional funding, or may supplement their resources with foundation or other external funding. The consortium may share a virtual or online union catalog. Publisher discounts, for example, are likely to be greater than for both or the either of two types of consortia, and there is more likelihood that tightly knit federations will develop defined and beneficial programmatic agenda over time.

5.4 Centrally funded statewide consortia

Finally, the central funded statewide consortium has a sponsoring agency and mostly separate source of funds. The central funds augment what each campus would be able to purchase solely from campus funds. Therefore, the central agency probably secures the contract and pays many or all of the cost involved, such as for database subscriptions. Members jointly agree on services to purchase based on shared interests. Staff is available to further the programmatic agenda, and the central administration may have a role in formulating or even mandating the agenda and policies. Virtual union catalogs are either in place or under development. In some cases, the central authority may operate inefficiently, but with a central source of dedicated funds, member libraries have more of an incentive to collaborate than with any of the other models.

6. SALIENT FEATURES OF THE CONSORTIUM

- Small group of homogeneous, like-minded professionals have facilitated better communication and understanding between publishers and an agent issuing individual invoice, single payment, signing by individual library.
- Model facilitated cross e-access to all print journals subscribed
- Members are not burdened with marginal interest journals, which otherwise is a standard offer of bundled journals from publishers.
- Institutional usage statistics is provided periodically, viz weekly, fortnightly and monthly.

It was win-win situation for both publishers and consortium participants in terms of the decreased cost of electronic access to e-journals and increased volume of sales for publishers.

7. FACTORS MOTIVATING CONSORTIA LICENSING

With print media, librarians buy objects/resources, which are owned. Most of the electronic information is not sold in tangible medium, as it is delivered via remote access and prefers to license usage rights. Publishers are more willing to lease, costly e-resources to library consortia under single negotiated agreement. For access to electronic resources, one needs licensing for

- Users need rapid on the computer screens, locations and time dependent;
- There is proliferation of electronic resources and electronic versions of traditional print materials; there is need to license databases;
- Funding agencies provided additional budgets to support access to researchers, to improve information access
- Negotiate for multi sites can save publishers and information providers time and money
- Consortia contracts bring many users eyeballs to a resource all at once.

8. BENEFITS OF CONSORTIUM

Library consortium is the virtual way to cope with the different problems of libraries through proper coordination and cooperation. Apart from these, duplication can be avoided as the situation calls for optimum use of resources by rational use of funds. The benefits of a consortium include:

- Quality of service is enhanced
- Cost of service is reduced
- Duplication of stock is minimized
- More information is available with less payment

9. E-RESOURCES PURCHASING

Cooperative subscription to electronic resources is the principal task of a consortium with focus on providing consortium-wide access to electronic resources to support education and research in core subject areas of its members. Consortium is responsible for carrying out negotiations with publishers and aggregators of electronic resources for getting better deals. The consortium has to handle orders and payments for all the subscriptions on behalf of its members. It also negotiates terms of licenses and agreements with the publishers. Convincing and coordinating with funding agencies is another task that a consortium has to perform. Key considerations for consortia based subscription to electronic resources include:

- Lowest rates of subscription for all consortium members
- Archival backup or perpetual access to e-resources
- Annual increase in rates of subscription
- Terms of license agreement
- Provision of a single interface for access to the titles includes consortium
- Research into the use of new technologies such as digital object identifiers, open URL, etc.

10. FUNCTIONS OF LIBRARY CONSORTIUM

Every library differs from one another according to its collection, information needs of users, working method, sources of finance, processing of information, etc. The various steps of jobs/functions can be adopted by a consortium for functioning standing on a common platform, which are:

10.1 Agreement for establishment of a consortium

A concrete agreement needed to be established for the participating libraries in consortia to achieve a common target. Every library will be able to work in such a manner that they are mutually exclusive, but they follow the common mission of a consortium as a whole. As a result, a managing committee should be formed.

10.2 Administration of library consortium

To run the total functions of a consortium smoothly a statutory body is very much essential to be formed taking Chief Librarian / Chief Information Manager from every library / Information Centre and one of them will act as a Chief Coordinator on rotation basis. Each library will inform about their collection, databases, user service, training of human resource for handling new equipment, etc. to the Chief Coordinator through hierarchical management level.

10.3 Financial Control

Due to financial crisis, libraries form a consortium for providing better service to the users. The crucial activity of the members of management committee is to take action on the following financial points like:

Whether a consortium fund be created to subscribe the core journals in different subjects in multiple copies at a discount rate;

How to manage the fund of a consortium and how much money is to be collected from each library as a contribution;

Whether the participating libraries to whom the responsibility to negotiate with some publishes are vested by the managing committee, will send remittance to the publishers for multiple copies from its own fund and adjust fund subsequently among the participating libraries;

what method of accounting standard is to be maintained to avoid any pilferage?

10.4 Joint work

As per guideline of a consortium, individual library will prepare a list of titles for resource sharing among participating libraries looking into the user demand and may also initiate to contact with different publishers for negotiation. All the participating libraries under library consortia must work jointly just like a joint venture in business sector to make the consortia a total success. Each library will subscribe the core journals and prepare the union list of titles to be covered under resource sharing program and the member libraries may also send full content page service of all issues of the title to another library.

10.5 Evaluation

After a certain period, the whole activities of a consortium (i.e. individual as well as co-operative) must be evaluated on the basis of the pre-determined objective. If there is any lacuna in between the work performed and to be performed should be adjusted by taking corrective measures in activities

in future. If there is a need for any change in the path of action, it should be changed immediately to achieve the objectives of a consortium.

11. PRESENT SYSTEM OF CONSORTIA IN INDIA

In India, we have seen some library consortia such as UGC Infonet of the university grant Commission, the INDEST (the Indian National Digital Library in Engineering and Science and technology) of the Indian Institute of technologies (IIT) and similar institutions, Consortium of the council of scientific and industrial research (CSIR) etc. Several other organizations such as the Indian council of Agricultural research (ICADR), State agricultural Universities, Indian Space research organization (ISRO), Defence research and development organization (DRDO), and some other individual groups of institutions have started working to form different consortia.

Some of the successful library consortia setup so far in India are:

- Indian national digital library in engineering science and technology (INDEST)
- UGC-Infonet E-journal Consortium
- Health sciences library and information network (HELINET)
- Forum for resources sharing in Astronomy and astrophysics (FORSA)
- Council for scientific and industrial research (CSIR) consortia for science direct
- Department of Atomic energy libraries consortia
- TIFR consortia for Springer journals.

12. CONSORTIA CONSTRAINTS SPECIFIC TO INDIAN LIBRARIES

- lack of awareness about consortia benefits
- Slow acceptance of e-information by the users
- Difficulties in changing the mind setup of librarians
- Maintenance and balancing both physical and digital library
- Inadequate funds
- Single point payment
- Rigid administrative, financial and auditing rules
- Problems of defining asset against payment
- Pay-per-view not yet acceptable
- Uncertainty about the persistence of digital resources
- Lack of infrastructure for accessing electronic sources
- Unreliable telecommunication links and insufficient bandwidth
- Lack of appropriate bibliographic tools
- Lack of trained personnel for handling new technologies
- Absence of strong professional association
- Big brother attitude

13. CONCLUSION

Providing access to e-resources to the faculty and researchers is not a purpose in itself. It is only a mean to trigger a stronger research and academic culture in the institutions recipient of this benefit. The consortium efforts should, therefore, lead to increase in productivity of scientific and research output both in quality and quantity. Ensuring optimal use of electronic resources is one of the biggest concerns for consortium that receives central funding from the Government. Libraries and information professionals are required to play a proactive role in promoting usage of resources amongst faculty and researchers

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Group Dynamics of an Organisation: A Social Network Analysis of TISS-Library

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Abstract : This paper is an attempt to examine how group dynamics operate in terms of relationship among group members of an organisation with special reference to Sir Dorabji Tata Library in Tata Institute of Social Sciences (TISS) by using Social Network Analysis (SNA) with help of Ucinet version 6.5. This study is based on relational data in (m x m) matrix form of 34 actors including both permanent and temporary workers of TISS-Library. The data has been collected with the help of structured questionnaire through interviewing method. The four main indicators of SNA, namely inclusiveness, density, degree and betweenness have been used to understand the social ties, strength of connections and power dynamics among the staff members of the TISS library. The main result shows that low-power dynamics functioning among stuffs in terms of relationship through frequency distribution of degree although inclusiveness shows one which represents all actors or nodes in Library are connected with each other. Interestingly, it is noticed from the study that betweenness and clustering co-efficient both are high in temporary stuffs which reveal that all temporary stuffs make shortest path among all actors and they are connecting with permanent as well as temporary members.

1. INTRODUCTION

Social Network Analysis (SNA) is the analysis which is based on an assumption of the importance of relationships among interacting units or actors or nodes. These relations can be defined as linkages among nodes which are a fundamental component of SNA (Scott, 2000). For instance, social network could be a group consisting of individual having interaction with each other, bonded by sentiments having common goal. Thus, network structure occurs in many kinds of complex system. But, unfortunately it is quite dissatisfying that very less is known about the dynamical properties of these systems because such real world network generally are not static but evolve in time. Thus, the emergence of network displaying social network of group or organization should be given proper attention.

Organizations are formed and managed by individuals, who come to work and get integrated with the organization as per their role and position. Group and subgroups are formed that determine social behaviour in an organization (Fincham and Rhodes, 2005) and reinforce the achievements of the organization. So knowledge of group interaction, their social ties and effectiveness is of central importance. The success of any organization depends upon the performance of its staff members who work collectively to achieve the goal.

Hence, the study of any kind of network of the real world that is of human relation, social network analysis would be the appropriate one. In any social structure there is inherent casual pressure in which network analysis tries to detect and measure the magnitude of the pressure. SNA involved mapping of relationships or ties among people or organizations. These relationships may comprise the feeling of people have for each other, the exchange of information etc., and thus network analysis try to uncover the emergent and informal communication pattern present in an organization.

Researchers use network analysis to gain insight into wide aspects of social phenomenon such as social inclusiveness of the setting, the process which underlie hierarchy and satisfaction, the formation of 'in' and 'out' group and so on.

1.1 About TISS Library

Our study was conducted in the Sir Dorabji Tata Memorial Library of Tata Institute of Social Sciences (TISS) which is considered as one of the best library of the country in the domain of social work and social sciences. Tata Institute of Social Sciences was established in 1936 and it became a deemed university in 1964. TISS-Library is the library of TISS containing good number of books, periodicals, national and international journals and data bases. At present, there are 22 permanent library staffs and 12 are temporary library staff. TISS library shares and provides documents, books, journals and other resources with other libraries such as International Institute for Population Studies (IIPS), Indira Gandhi Institute for Development and Research (IGIDR), IIT Bombay, SNDT Women's University, Mumbai University, Nirmala Niketan and so on.

1.2 Objectives

Thus, this paper intends to see how network analysis could capture the social ties among the staff members of the TISS library and develop an understanding about the group dynamic among the members that exists in the organization which has made an explicit use of social network analysis methodology in order to provide empirical support to innovation theories or conceptual frameworks. This paper also argues that studies using network analysis tend to focus on the relationships between interacting units or nodes of an organisation.

The present paper has been structured into five sections. Section-1 dealt with the introductory part of the study. Section-2 discusses about review of literature based on social network and group dynamics. Methodology and data sources have been discussed in section-3. Section-4 produces the findings and data analysis part of the study. Concluding remark discusses in section-5.

2. SOCIAL NETWORK AND GROUP DYNAMIC: A REVIEW OF LITERATURE

A network is a set of nodes connected by a set of ties. The nodes can be anything such as individuals, teams, organisations, concepts, patents, etc (Coulon 2005). In the case of social networks the nodes are individuals. Social ties among individuals can enhance or hamper the effectiveness of any organization. In any organization, it is the strong or weak social ties among individuals that binds them together in a group or keep them apart. The study conducted by Mcperson, Popielarz and Drobnic (1992) reveals that weak ties differentially pull members out of their groups and into a new group while strong ties keep members in their current group. In an organizational level, researcher focuses on the impact of embeddedness in social networks on organizational behaviour (Bandelj and Purg, 2006). Granovetter (1985) in his research clearly establishes a positive relation between human behaviour and social network. Moreover social ties have been recognised as a very powerful source for pulling out resources in the organization. Ficher (1982) and Labianca and et. al. (2000) indicate that as social tie strengthen the relationship moves from instrumental to more expressive elements , a change that creates the opportunity and motivation for the members of the relationship to transmit (cited in Oh, Chung and Labianca 2004). Firebaugh (1980) and Manson (1993) have also pointed that individuals are embedded simultaneously in the social structure of a group or an overall examination. Davis (1963) recognised that interpersonal attraction theorist, exchange theorist and others shared a

basic abstract notion of the social organization of ties that implies clustering at the level of group structure (Cited in Feld 1981).

Groups do not exist in isolation; they are embedded in a network of relationship. Various kinds of relationships are evident between groups and organizations. Looking at the importance of groups, scholars involved in doing research to develop an understanding about the group dynamic within the organization. The term dynamic in "group dynamic" implies the kind of interaction, continuous changes and adjustment in relationship among group member. Group dynamic is based on group processes that develop through interactions and influence between individuals and the group and serve as key ingredient in the overall psychosocial system of organizations.

Organizational groups are seldom self-sustaining. Groups are in constant interaction with the environment pursuing for better opportunities and facing threats (Lawrence and Lorsch 1967; Allen 1977). But, very often organization restrict the opportunities of different group to interact due to which group face problems that in turn affect the performance of the organization.

There is extensive research on interaction and effectiveness of small groups (Gist, Locke and Tylor, 1987). There were researches in group development mainly focusing on attention and integration of members into the group, the development process, and norm and team development.

Research suggests that an individual can be influenced by many different factors on many different levels. Individual can be influenced by majority, a certain situation, a leader, a persuasion, their own behaviour and attitudes. So when any individual become a part of any group there is clear reason behind (Gist, Locke and Tylor 1987). Group cohesion is the other aspect that received attention from scholar. According to the literature, the group cohesion depends on the extent that the individuals in the group want to accomplish the group's common goal and group identity. The cohesive group consists of having common identity, a sense of shared purpose and a structured pattern of communication (Carron 1980). Burt (1992) talked of closure and bridging relationship within a group. Coleman (1988) further explained that group members connected by strong relationship ties benefit from embedded and dense network in their closed group. Moreover, in the work place group is expected to have more bonded solidarity, stronger reciprocity norms, greater trust (Granovetter, 1985).

Looking at the literature, we could realise that there are no doubt extensive work have been done in group dynamic and social network independently. But, less work have been done to see how social network analysis can be utilised to understand the group dynamic of an organization. Hence, this study is an attempt to understand the 'group dynamics' in an organisation with special reference to TISS-Library.

3. METHODLOGY AND DATA SOURCES

This present study had been conducted during February 2008 to March 2008 in Sir Dorabji Tata Memorial Library of Tata Institute of Social Sciences, Mumbai. At the time of survey, there are 22 permanent and 12 temporary staf in the library. The aspects that we set out to map were the density, centrality, betweenness, clustering co-efficient and clique in the network of relationship among the staff members. Relational data has been used in (m x m) matrix form.

A self completed structured questionnaire was administered to staff. Data has been analysed with the help of Ucinet Software Version 6.5. We calculated density of ties to understand cohesiveness among the staff members. If the density score is 100% then it is concluded that every individual in

the network know each other. Network centralization is to understand the powerful individuals within the network which means we can come to know who the individuals' rules, dominate or control others in the network. Betweenness measures the extent to which a particular individual lies between the various other individual in the network. In other way, it measures the extent to which an agent can play the part of a broker or gatekeeper with a potential for control over others (Scott, 2000). Clique is nothing but the sub-group within the network.

4. FINDINGS AND DATA ANALYSIS

The group of members can be homogeneous or heterogeneous in nature but the members of an organisation must be heterogeneous with respect to their positions in the formal and informal structures of the group (Blau 1969). The bridging mechanism emphasises the importance of ties connecting heterogeneous people (Burt 1992).

In the present study, total number of the actors (n) is 34 and maximum number of ties is ${}^{n}C_{2}$, i.e., ${}^{34}C_{2}$ which is equal to 561. The ties in the present case are undirected which means identical relationship with each other. For instance, the relation of A to B is assumed to be identical with the relation of B to A. It can be shown as follow:



In this present paper, we have created matrix of 34 actors[1], including both permanent and temporary stuffs based on primary data collection from the TISS-Library. Each cell of the matrix represents the social network of library stuffs. It represents the tie between two actors in terms of good relationship in the library. The data is dichotomous data, say one or zero otherwise of each cell. If data is one means there is two-way relationship between two actors and zero otherwise.

Table 1 describes the descriptive statistics of the social network analysis. From that data we have computed two very important measurements such as inclusiveness and density. Inclusiveness refers to the number of the actors that are connected with other actors within the network while density defines the ratio of the number of ties in the network to the maximum possible of the ties within the network (Scott 2000). Inclusiveness and density both differ zero to one. In this present study shows that inclusiveness of this social network is one which represents all actors of the network are connected with each other, i.e, no actor is isolated from this network.

Table 1: Descriptive Statistics of Social Network of Library Member at TISS

Number of actors	34
Number of connected actors	34
Isolated actors as percentage	0
Inclusiveness	1.0
Maximum possible ties[2]	561
Number of ties in the network	266
Density[3]	0.2371

Source: Computed by authors from primary data collection from TISS Library

Another important measurement of the network of the present study is degree. Degree of a node or point means a numerical measure of the size of its neighbourhood (Scott 2000). The total sum of

the degrees of all the points in a graph must equal twice the total number of lines in the graph (Scott 2000: p 67) and density is equal to (2 x number of ties)/n*(n-1). Hence, interestingly, it is noted that there is a positive relationship between degree and density.

Degree centrality measures network activity (Freeman 1979). Table-2 represents the frequency distribution in percentage of the degree and it shows asymmetric. It means that some of the library stuffs, 44 percent, they have identical good relationship among others (Table 2). It indicates that there is low-power dynamics in terms of the relation among library stuff.

Table 2: Frequency distribution of the degree

Degree Interval	*Frequency Distribution (in %)*
1-5	44
6-10	26
11-15	15
16-20	12
21-25	3

Source: Computed by authors from primary data collection from TISS Library

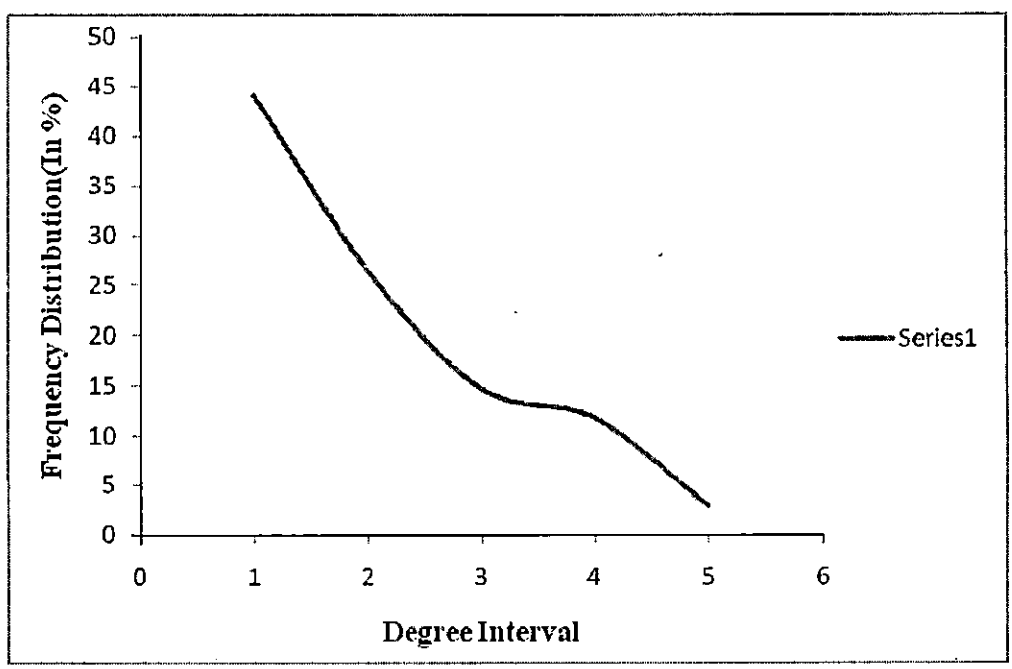


Figure 1: Percentage distribution of degree in the social network of Library Stuff at TISS

Scott (2000) defines component as a 'maximal connected sub-graph'. A sub-graph is connected when all of its points are linked to one another through paths, but no path run to points outside the component. The main component has been examined by two measures. All actors in the library are weighted by two measures of centrality, viz., degree and betweenness. The degree of a node defines as the number of lines that are incident with it or the number of nodes adjacent to it where as betweenness refers to the number of times an actor occurs on a shortest path between actors in the network (Wasserman and Faust 1994). Clustering coefficient is a property of a node in a network

(Wasserman and Faust 1994). It defines how one node is well connected with the neighborhood. The clustering co-efficient varies between 0 and 1. If the neighborhood is fully connected, the clustering coefficient is 1 and a value close to 0 means that there are hardly any connections in the neighborhood. Table 3(a) shows the cluster co-efficient and betweeness of ten actors in the library according to ascending order of values. Interestingly, it is noted that temporary library stuffs have greater clustering co-efficient than permanent stuffs in the TISS library. It is also noticed that temporary stuff has also highest betweenness that means he has good power to connect with others (Table 3(a)).

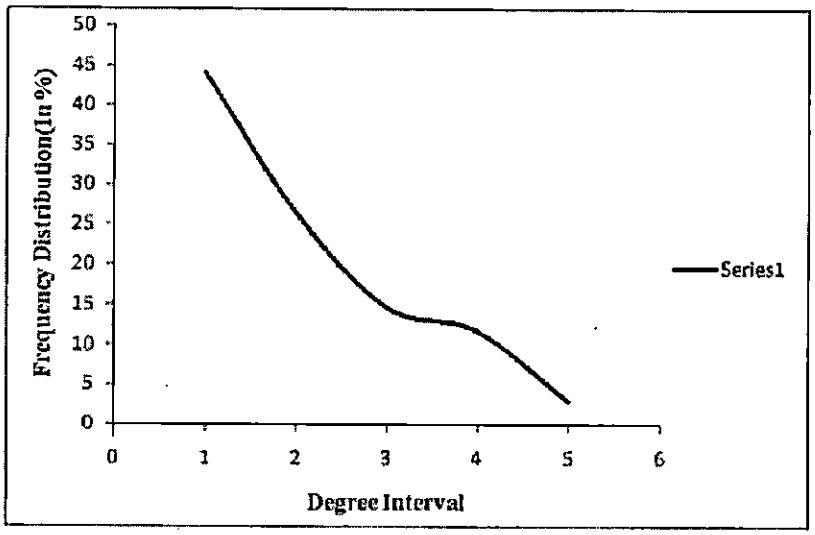


Table 3 (a): Clustering Co-efficient and Betweeness

Sl. No.	Actor in an Organisation	Cluster Co-efficient	Actor in an Organisation	Betweeness
1.	Lb-27-T	1.00	Lb-24-T	116.26
2.	Lb-31-T	0.86	Lb-18-P	105.59
3.	Lb-32-T	0.86	Lb-23-T	90.00
4.	Lb-15-P	0.81	Lb-2-P	79.56
5.	Lb-33-T	0.80	Lb-1-P	67.52
6.	Lb-34-T	0.79	Lb-26-T	63.00
7.	Lb-11-P	0.67	Lb-22-P	46.84
8.	Lb-10-P	0.66	Lb-16-P	37.07
9.	Lb-7-P	0.59	Lb-3-P	34.52
10.	Lb-8-P	0.57	Lb-12-P	33.46

Source: Computed by authors from primary data collection from TISS Library

Table 4 (b): Degrees of TISS among library stuffs

Sl. No.	Actor in an Organisation	Degree
1.	Lb-2-P	21.000
2.	Lb-1-P	20.000
3.	Lb-7-P	16.000
4.	Lb-4-P	16.000
5.	Lb-5-P	16.000
6.	Lb-10-P	15.000
7.	Lb-8-P	15.000
8.	Lb-6-P	13.000
9.	Lb-16-P	11.000
10.	Lb-3-P	9.000

Source: Computed by authors from primary data collection from TISS Library

According to size of the rectangular in figure 2(a) shows higher betweenness among library stuffs. Thus, temporary worker (Lb-24-T) has the highest betweenness where as figure 2(b) shows that degree among library stuffs.

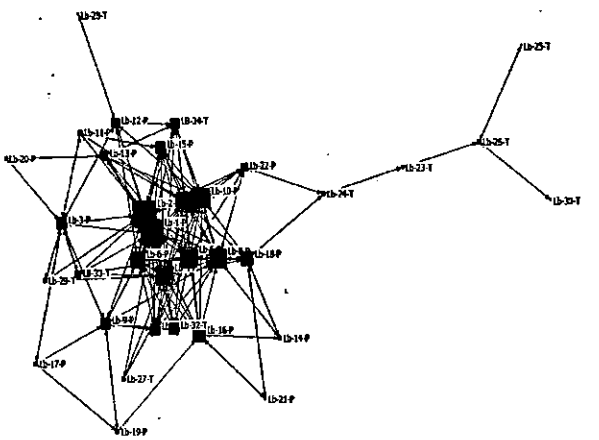


Figure 2 (a): Betweeness

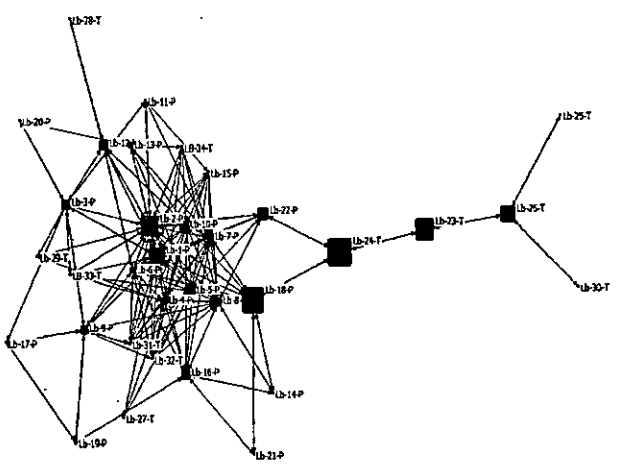


Figure 2 (b): Degree

A clique is a sub-set of points in which has every possible pair of points is directly connected by a line and clique is not contained in any other clique (Scott 2000). More specifically, Nooy (2005) defines that a clique is a maximal complete subnetwork containing three vertices or more. Following figure-3 shows that all are well connected with each other in terms of the good relationship.

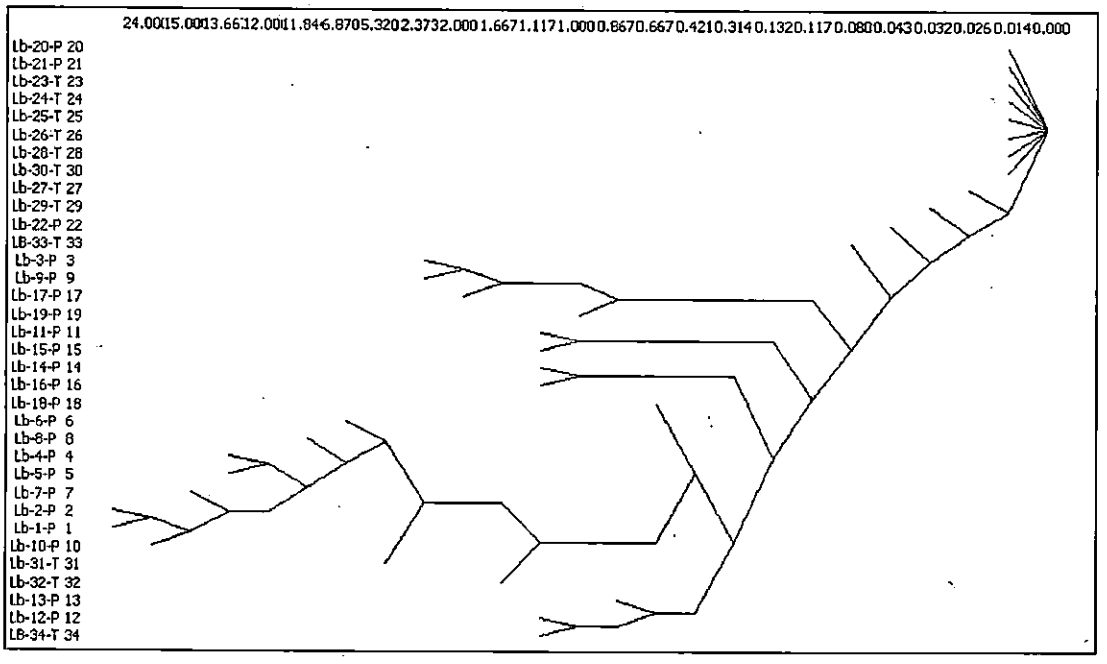


Figure 3: Clique

5. CONCLUSION

Descriptive statistics shows that there is high inclusiveness which represents all the actors are connected with each other and it also shows that all stuffs are very organised and controlled by main authority in the library. On the contrary, the study also explores that there is asymmetric frequency distribution of degree distribution which indicates some of the actors are very active and some of them are not within this organisation. Clique (Figure 3) shows that the library is very well organised. Moreover, it can be concluded that the temporary library stuffs have equal role in terms of good relation with all other stuffs. In some case, temporary stuffs play key role in connecting with others.

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Information Sharing in Defence Organisations

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Abstract: The article outlines the overview of Institutional Repositories (IR) through open source software in Defence Organisations. Sharing of Information is important aspects in Defence Organizations and Institutional Repositories are most media / tool for the purpose. The article also describes the features of Defence Organisations, application of Institutional Repositories in various fields and specific requirements in these organizations. There is now a variety of open source and commercial software platforms available to develop an IR. The paper highlights about general overview of Institutional Repositories, open source software, and benefits of IR in Defence Organisation.

Keywords: Institutional Repository, Defence Organisations, Open source Software

1. INTRODUCTION

In today's World, with advances in Computers and Networking, Information Technology plays a vital role in various fields. The knowledge sharing is one of the most important aspects of Information Technology, which results in speeding up Decision Making, Research, Planning, Manufacturing & so on.

The developing nations too have laid major emphasis in Information Technology for fast growth and development. The Defence Establishments too have applied Information Technology in various fields. To quote an example, Information Warfare has added new dimension to the battlefield, with emphasis on obtaining and disseminating the required information about enemy and own troops/ equipment/ defence potential , terrain etc and denying the same to enemy for success of military operation.

In case of Defence Establishments involved in Research, information sharing about research work among scientists can speed up the research process and nation can achieve technological jump, resulting in self reliance.

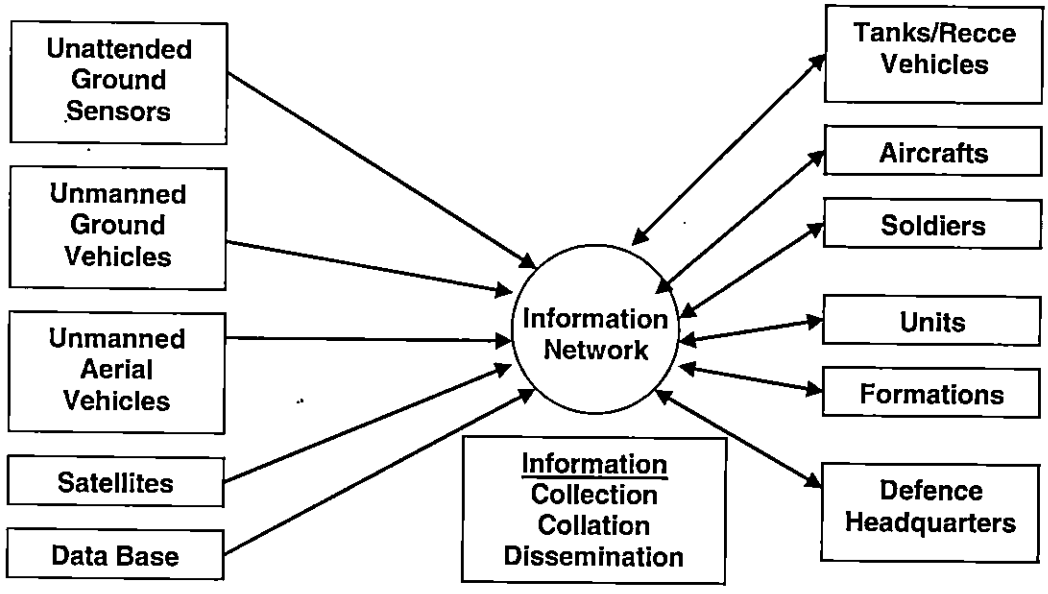
Under such circumstances, An Institutional Repository provides a firm base for knowledge sharing among various agencies and can smoothen out and speed up the research process/ information sharing in any nation.

2. DEFENCE ORGANISATIONS AND INFORMATION SHARING

The information sharing is an important aspect for all Defence organizations in various field. Some of the applications of IR are discussed in subsequent paragraphs.

2.1 Armed Forces (Army/Navy/Air Force)

(a) **Information Warfare.** Information Warfare has added new dimension to the battlefield, with emphasis on obtaining and disseminating the required information about enemy and own troops/ equipment/ defence potential , terrain etc and denying the same to enemy for success of military



Unattended ground Sensors which will be connected through network, so that every soldier / commander / operator has access to the information about own / enemy troops and their movement, terrain, maps/ photographs, progress of battle etc which are essential for success of operation and will avoid fog of war.

(b) ***Equipment Procurement.*** Armed Forces always have to maintain technological superiority. Hence whenever new equipment is being procured, they have to ensure that the equipment is most suitable and incorporated with latest technology. Through information sharing, useful inputs from other Defence Establishments like Defence Research Establishments, Services Training establishments, Defence Production etc can be made available to Armed Forces which can smoothen out decision making by them.

(c) ***Training.*** Information sharing among various Training Establishments under Armed Forces can improve training standards with no extra cost. To quote an example CBT packages made by one training establishment can be used by others as good training aid.

(d) ***Research.*** Small projects undertaken by Armed Forces in-house to improve operational efficiency can be shared with others.

(e) **Logistics/ Administration.** Information sharing plays an important role in improving Logistics and Administration and can be undertaken by all three services (Army/Navy /Air Force) through their web site on Internet as well as their respective Intra-Net for the purpose.

2.2. Defence Research Organisations

(a) **Research.** Information sharing among Scientists can certainly enhance the Research Potential. As it is, the subsystems of various military equipments are developed by different laboratories and then integrated. Under such circumstances, periodic development progress can be shared by laboratories involved in the project. Also sharing of research papers among scientists, other training establishments / universities and other agencies will result in better/faster research and the nation can look for self-reliance for time to come.

(b) **Administration.** Information sharing can enhance the administration in such organization through its Web Site on Internet as well as its own Intra-Net.

2.3. Defence Production/ Government Public Undertakings.

(a) ***Manufacturing***. Information sharing among various manufacturing agencies involved in manufacture of military hardware can smoothen out production problems and enhance production rate and quality.

(b) ***Machinery Procurement***. For better manufacturing of military hardware, better machines can reduce rejection and ensure quality. The information can be shared among the manufacturing agencies.

(c) ***Product Improvement***. Now days, Defence production agencies are also involved in product improvement of existing military hardware. The information sharing about technology from scientists and users feedback from armed forces can speed up process of product improvement.

Thus in general, information sharing within and among various Defence Organizations in the Nation can enhance the knowledge base, which will not only improve the fighting capability but also the nation can achieve self reliance.

However, as on date the information sharing is mainly observed in two following ways:-

(a) ***Internet*** – Web sites have been opened by various Defence Organizations, where general information is being shared with public as well as members of these organizations.

(b) ***Intranet***. Defence Organizations have also gone in for respective dedicated Intranet for information sharing within their organizations.

Thus there is as such no information sharing among these organizations online.

3. INSTITUTIONAL REPOSITORY (IR) FOR DEFENCE ORGANISATIONS IN DEVELOPING COUNTRIES

As brought out earlier, Information sharing among as well as within various Defence Organisations has large benefits and Institutional Repository can be considered as most viable option.

3.1. Institutional Repository

(a) An **Institutional Repository** is an online locus for collecting, preserving, and disseminating the intellectual output of an institution, particularly a research institution in digital form. For any organisation, this would include materials such as research journal articles, before (preprints) and after (postprints) undergoing peer review, and digital versions of theses and dissertations, but it might also include other digital assets generated by normal academic life, such as administrative documents, course notes, or learning objects.

(b) Major objectives of any Institutional Repository are as follows :-

- to create global visibility for an institution's scholarly research;
- to collect content in a single location;
- to provide open access to institutional research output by self-archiving it;
- to store and preserve other institutional digital assets, including unpublished or otherwise easily lost ("grey") literature (e.g., theses or technical reports).

(c) Various software are available to establish Institutional Repository like DSpace, Eprint, Fedora etc.

Most of the Defence Organizations can establish Institutional Repository through their Intra-net; however it can only be accessible to members of respective organizations and not to others. However

in case these repositories are established on Internet Web Site, it can be accessible to others including general public, which may not be desired as these Defence Organisations will not like to share information on Internet due to security / defence research requirements.

3.2 Specific Requirements of IR for Defence Organizations

Thus Institutional Repositories for Defence Organizations have specific requirements. As per feedback from members of various Defence Organizations, specific requirements as regards to IR are listed as follows:-

(a) ***Security of Information.***

- The highly classified information such as Operational Plans certainly cannot form part of any Institutional Repository, whether on Internet / Intranet.
- However information of Research in various fields, Technical Papers, User's Perception/ Feedback, Administrative Information certainly can form part of Institutional Repository unless it is compromising Security aspect. **The basis of information sharing in Defence Organistions is "Need to Know".**
- IR software should have inbuilt facility to limit access for reading / submitting articles with password protection.

(b) ***Connectivity.*** Institutional Repository should be accessible even in far flung Field areas, so that Service Personnel posted to these areas can access the IR for reading / submitting articles for updating their knowledge base.

(c) ***User Identification.*** With present software of IR, anyone can become authorized member of any Institutional Repository and can access the articles not meant for general public. Hence proper User Identification is must, for authorization / usage of IR.

(d) ***Experts.*** Once IR is open to users, there will be information overflow through submission, leading to information garbage. Hence IR should have facility to monitor the submission of articles through experts in various fields in Defence Organizations, preferably online as these experts will be available at different locations .

(e) ***Author.*** The name & details of author should be available on demand in IR software, so that further interaction, if required, by any user can be done, however it should be shown to general public. Also preferably open dialogue box should be available for interaction between author and reader. Author should also be amend / improve his previous submission online.

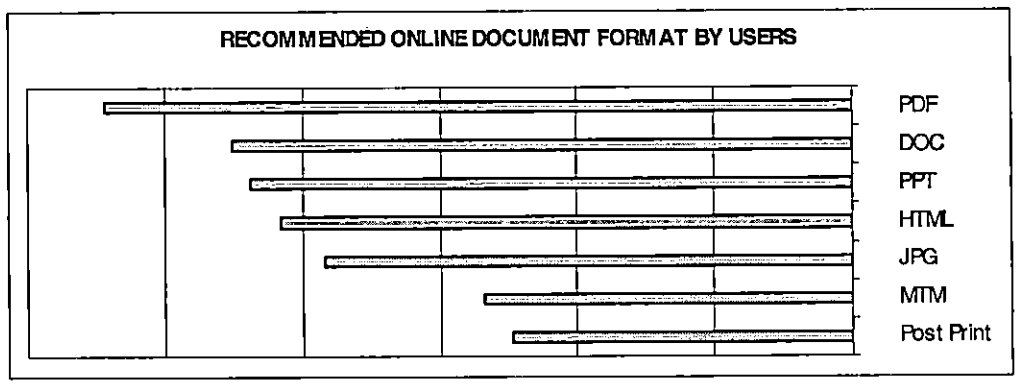
(f) ***IPR (Intellecual Copy Right).*** The submitters should be well aware about IPR before submitting the article, which should be made clear initially to Users, which otherwise may lead to legal problems. The issue also can be monitored during listing of article in IR.

(g) ***Search Engine.*** Once IR starts expanding with Information overflow, unless proper search engine is available, it will be difficult to retrieve the required information in time. IR should have facility for Quick search as well as various categories / sub categories for articles in different fields.

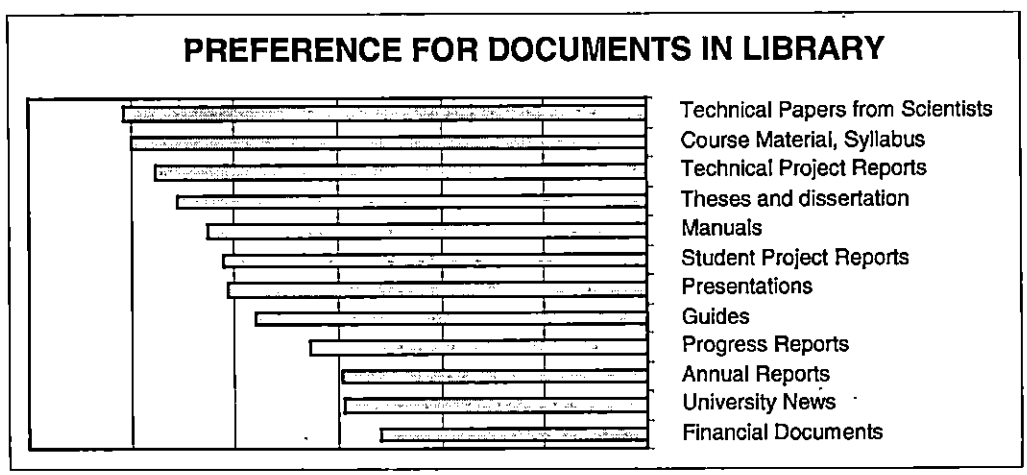
(h) ***Digitalization of existing volumes.*** Existing volumes which have relevance are preferred to be digitalized and should form of IR by access by users.

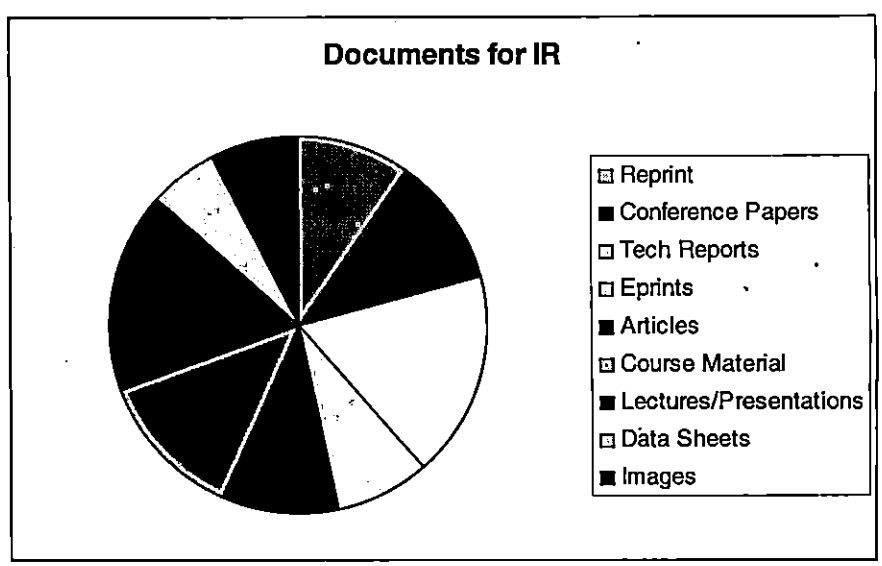
(i) ***Format of Documents.*** The format of articles should be full text with bibliography and not abstract or bibliography alone, as users in field areas may not have access to books/articles referred in bibliography.

(j) ***Document Format***. Normally with awareness/ practice among members of Defence Organizations, the document format most preferred is PDF, Microsoft Word, Microsoft Presentations.



(k) ***Articles in IR***. The articles preferred for IR are Articles on Technologies, Technical Reports, Research/Conference Papers and Project Reports. In addition for training establishments, Course material and Lectures cum Presentations are preferred.





Suggested Solutions. Institutional Repositories have very large benefits in Defence Organizations. However keeping in view specific requirements, following are some suggested solutions:-

(a) ***Internet / Intranet.***

i) Every Defence Organization / Establishment can establish Institutional Repository on their Intra-net for sharing of information within their respective organization only. The articles may be related to their respective field.

ii) In addition, common IR can be established on Internet Web Site at Specific Institutions, where information among members of various Defence Organizations can be shared.

(b) ***Software for IR.*** The software for IR should have facilities like authorized access with password to ensure security, controlled submission by experts online, search engine, author details, IPR, various document formats, online amendments of articles etc.

(c) ***Authorization.*** Members of Defence Organizations are issued with Identity Cards with Unique Personal Number, which should be incorporated to provide authorization for reading / submitting articles to IR. In addition, a letter from Unit / Organization of the Individual should form part of authorization procedure.

(d) ***Categories in IR.*** Prior to establishment of IR, various categories / sub-categories for different fields are required to be listed and should be formed in IR.

(e) ***Nomination of Experts.*** Prior to establishment of IR, experts in various fields are required to be decided and nominated and also their names should be entered.

(f) ***Formats of articles.*** As per specific requirement above, format of articles in IR should be full text with PDF, Word or presentations on various subjects.

4. CONCLUSION

Institutional Repositories (IR) have proven to be great means for information sharing and very much applicable to Defence Organizations with specific modifications. With IR in Defence Organizations not only these organizations can excel in their respective fields but the Nation can move towards Self-Reliance.

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Library Consortium: An Answer to Resource-Sharing among University Libraries in Sri Lanka

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Abstract : University libraries in Sri Lanka come in all shapes and sizes, whereby, their purpose, collections, human expertise and patrons constitute unique mixtures of information services and resources. There are 15 universities coming under the authority of the UGC, which finance these institutions for their developmental activities. Each university has a number of specialized faculties and affiliated institutes. For the past decades, the libraries of these universities and their corresponding institutes are gradually suffering from shrinking resources in terms of monies, human resources, space, and facilities of information and communication technologies. With the declination of resources that are essential for effective library services and practices, university libraries in the Island ought to seek alternative platforms to persevere in the information business. Most of these libraries' funds flow into the acquisition of printed materials, especially monographs and journals. And, making the electronic resources available to the library users seems unaffordable for libraries, except for a few. Thus, it clearly indicates that these libraries are not self-sufficient. Acquisition of information resources with ever-increasing cost of materials and shrinking library budgets will be driving these libraries to work in cooperation. This cooperation must naturally be a library consortium. The research explores how far these libraries perceive the danger of depletion of their resources, finds ways in which the libraries share their resources, scrutinizes what makes them not to build consortium for resource-sharing, and finally it proposes avenues for resource-sharing among these academic libraries with the aid of consortium. The results show that most of the university libraries are encountering financial shortages to build their collections and to renew the subscriptions to electronic databases. These libraries are facing human resource shortages, in terms of information technology. The Librarians reflected that the attitude is the major barrier for initiating library collaborations. And the overall opinion of librarians on consortial movement is also positive. Academic libraries around the globe have been doing resource-sharing for years, in the shape of consortia. Therefore, Sri Lankan university libraries are no exception to follow this successful means of resource-sharing. In this digital world, with the advancements of efficient networking afforded by the Internet and other web technologies, resource-sharing networks are now possible to connect the smallest and most specialized of libraries in any corner of the country.

Keywords: University Libraries, Resource-Sharing, Library Cooperation, Library Networks, Library Consortia, Interlibrary Loan (ILL), Union Catalogues.

1. INTRODUCTION

Sri Lanka is located 880 km north of the equator, adjacent to the southern tip of India. The country is from north to south 435 km and from east to west 225 km. With an area of 65,610 sq. km, the country is inhabited by 19.04 million people. Sri Lanka has a reasonably well developed economic infrastructure whilst continuing to be an export-import economy. Early beginnings of scientific research were in the field of Agriculture, Forestry and Veterinary Science during the 19th century. The 20th century saw the establishment of research laboratories for agriculture. The government has a virtual monopoly of educational services at primary, secondary and tertiary levels and provided education free of charge to all children since 1945. The University system of education in Sri Lanka has undergone many vicissitudes since the first University of Ceylon was established in 1942.

Sri Lanka being one of the developing countries has common constraints like, lack of critical manpower in information technology, lack of physical resources and infrastructure, and inadequate financial input. In spite, one advantage it does have is the relatively small land area it covers, and this consequently allows communication and concerted action in any field. Thus, the development of networks is becoming possible (Warnasuriya, 2001). These constraints and advantages reflect in the university education, as well.

The library and information services and practices are being pressed by ever-increasing price of information resources, narrowing budgetary allocations, limited storage, inundating information on every possible field of knowledge, and escalating user demands. Thus, libraries are to be transformed to ensure perpetual existence in provision of effective and efficient user services. The paper looks into the need and avenues for resource-sharing among university libraries in Sri Lanka.

1.1 Networks and Attempts for Resource-Sharing

In Sri Lanka, there is considerable number of networks operating on different fields; however, they mainly focus on science and technology. The idea of library cooperation was sprouted out with the establishment of a central organization for science and technology information, which was the Sri Lanka Scientific and Technical Information centre which was set up in 1977 under the National Science Council with assistance of the UNDP. It had the mandate to coordinate with other libraries, thus, the centre established the SLSTINET (Sri Lanka Scientific & Technical Information Network) in 1979 (Warnasuriya, 2001).

A network is defined as a set of persons or organizations with a common goal or set of objectives, for the purposes of sharing each others resources for greater effectiveness with a consequent saving of resources both human and financial. By networking the resources of a participating organization, could be made available to all others in the network (Warnasuriya, 2001).

There have been five (05) prominent information networks operating in Sri Lanka, *viz.* SLISTINET (Sri Lanka Scientific and Technical Information Network), AGRINET (Agriculture Information Network), HELLIS (Health Literature and Library Information Service), ENLINET (Environmental Library Network) and INNES. These networks have been established for promoting research and development in their dedicated fields of knowledge. The AGRINET was initiated in 1982, with the membership of about 30 participating libraries currently functions as a thrust area of the Sri Lanka Council for Agriculture Research Policy (CARP) (Mudannayake, 2006). Almost 90 institutions and information centres in Sri Lanka are active members of SLISTINET. Based on the relevancy, university libraries hold membership to actively participate in the documentation and dissemination of information that will ultimately contribute to the country's development.

1.2 University Libraries

There are, at present, 15 universities in Sri Lanka offering degrees in various fields of knowledge. Each university has a main library and faculty and/or institutional libraries. These libraries are primarily funded by the UGC that functions as the apex body of the University System in Sri Lanka, which was established in 1978 (*www.ugc.ac.lk*). Being a single source of finance, the government and the UGC have been reducing the funds allocated for the libraries, over the past years.

Therefore, many of the universities in the western province can be reached within hours those in the southern, central and western provinces, except for the ones in the north and east due to the two-decades of ethnic crisis that shattered the whole country's economic and social structure can be reached within a day. As a consequence, the infrastructure of Sri Lanka is promising for its information and telecommunication developments. ICT facilities in these universities, in general, are capable of underpinning information services of good quality.

However, budget restrictions and the rising price of information materials is an impediment to better services rendered to users. Both the information systems and the library professionals are adapting to meet the changing needs and growing expectations of the users (Jalloh, 2000). The initiatives and development in the areas of automation, networking, resource sharing, consortia, digital libraries,

electronic document delivery, etc. have causes to emerge new practices in the operations and management practices of the libraries world over (Francis, 2005).

As long as the pattern of higher education and research is inter-disciplinary, the information requirements are also cross-disciplinary. This underlines the need for providing access of information in all subject areas to the undergraduate, postgraduate students and the academicians. This justifies the establishment of a Library Consortium among these university libraries which automatically will bring economy, efficiency and equality in information availability and use throughout the country.

2. OBJECTIVES OF THE STUDY

This study is intended to discover the need for efficient and effective resource-sharing collaborations between academic libraries in the Island (Sri Lanka). It examines the rationalization of expenditure on library collections. Most importantly, the study seeks ways to devise a consortium model for these institutions by scrutinizing the library resources spent on them and to provide a positive attitude towards library cooperation without which there can be no resource-sharing.

3. METHODOLOGY

The methodology used in this study was a questionnaire-based and conducted to identify the scarcity of library resources, library services and practices, and to analyze the attitude of librarians towards building library consortium among university libraries. Since the number of institutions is just below fifty, no sampling was needed. All 15 key-informants who hold the posts of Head Librarian were distributed with questionnaires to elicit information on their library resources, information services, library practices, infrastructure facilities and their attitudes towards networking. When necessary, telephone interviews were also carried out to verify the collected data as well as to obtain essential data.

Another questionnaire was circulated among librarians who hold the in-charge of faculty and institutional libraries (*See* Table 1). Data from both questionnaires has been analyzed by using the Statistical Package for Social Sciences (SPSS). These investigations have helped to find the strengths of the Island's academic libraries' resources; as a consequence the feasibility of libraries being able to work together can be analyzed. The attitude of librarians towards the introduction of library consortia was analyzed by applying the Likert Scale.

Table1: Number of Librarians and Sr. Asst. Librarians or Asst. Librarians who are in-charge of the Main libraries and Campus/Branch or Faculty Libraries.

Institution	Librarian	Asst. Lib/ Sr. Asst Librarian At Faculty Libraries	Asst. Lib/ Sr. Asst Librarian At Institutional/ Branch Libraries	Total No. of Subjects
University of Colombo	01	02	03	*06*
University of Peradeniya	01	06	01	*08*
Uni. Of Sri Jayewardenepura	01	01	01	*03*
University of Kelaniya	01	01	03	*05*
University of Moratuwa	01	00	00	*01*
University of Jaffna	01	01	01	*03*
University of Ruhuna	01	03	00	*04*
Eastern University, Sri Lanka	01	01	02	*04*
South-Eastern University, Sri Lanka	01	01	00	*02*
Rajarata University	01	04	00	*05*
Sabaragamuwa University	01	01	00	*02*
Wayamba University	01	01	00	*02*
Open University	01	00	00	*01*
Visual Performing Arts University	01	00	00	*01*
Uva Wellassa University	01	00	00	*01*
Total	**15**	**22**	**11**	**48**

Secondary sources of information such as statistical reports, relevant literature were also consulted to support the objectives of the study.

4. RESULTS AND DISCUSSION

The period of establishment of universities in Sri Lanka can be seen in three decades; universities founded before 1980s, the ones established between 80s and 2000, and institutions founded after 2000. UGC is the apex body that governs and funds these institutions. Thus, the flow of government funds has been critical when new faculties and universities are established.

Emergence of new courses and departments in existing institutions is also causing severe shortage of expending the allocated money among the departments. Students' enrollment into university education has also been increasing over the past years (Statistics 2007/ UGC, Sri Lanka).

4.1 Financial constraints

Sri Lankan government is the major source of funds for these 15 universities (Figure 1). The government funds are funneled through the UGC. The libraries are obviously facing diminishing levels of library funds every year while their expenditure on acquisition of information materials is expanding (See the table 2).

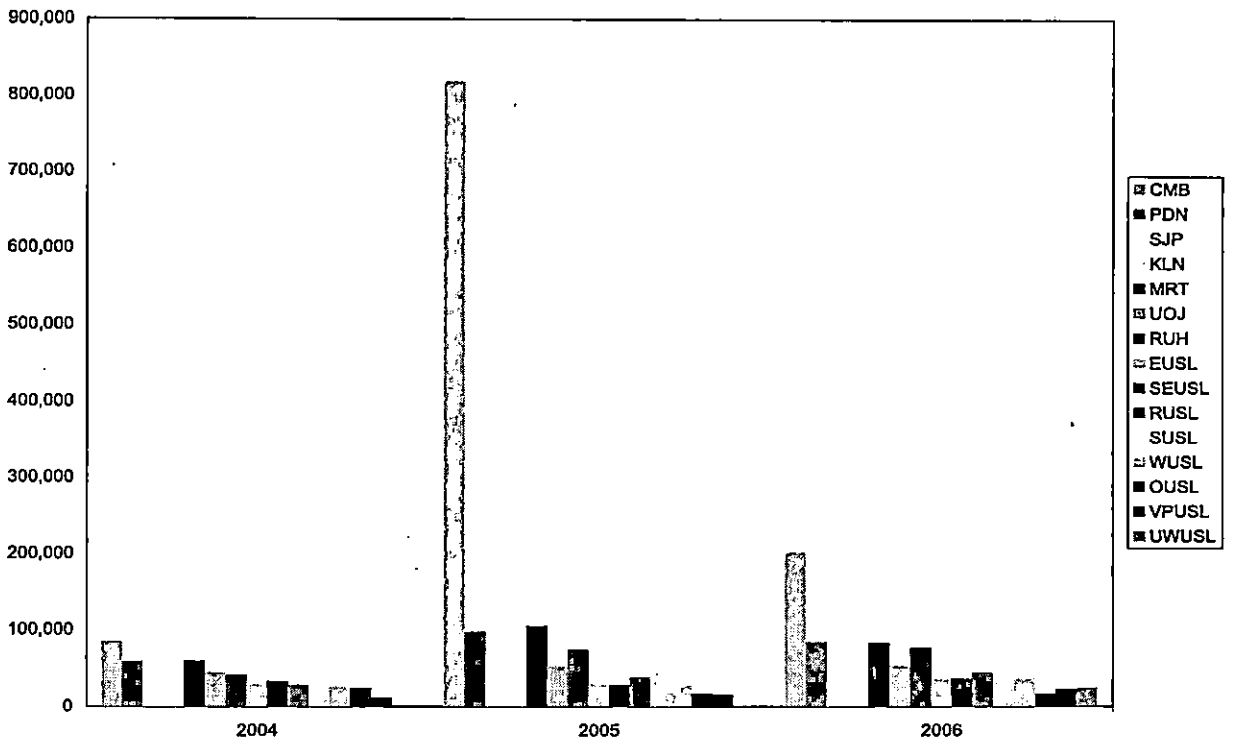


Fig.1: Pattern of Expenditures on Equipment, Furniture, Library Books & Periodicals in the universities

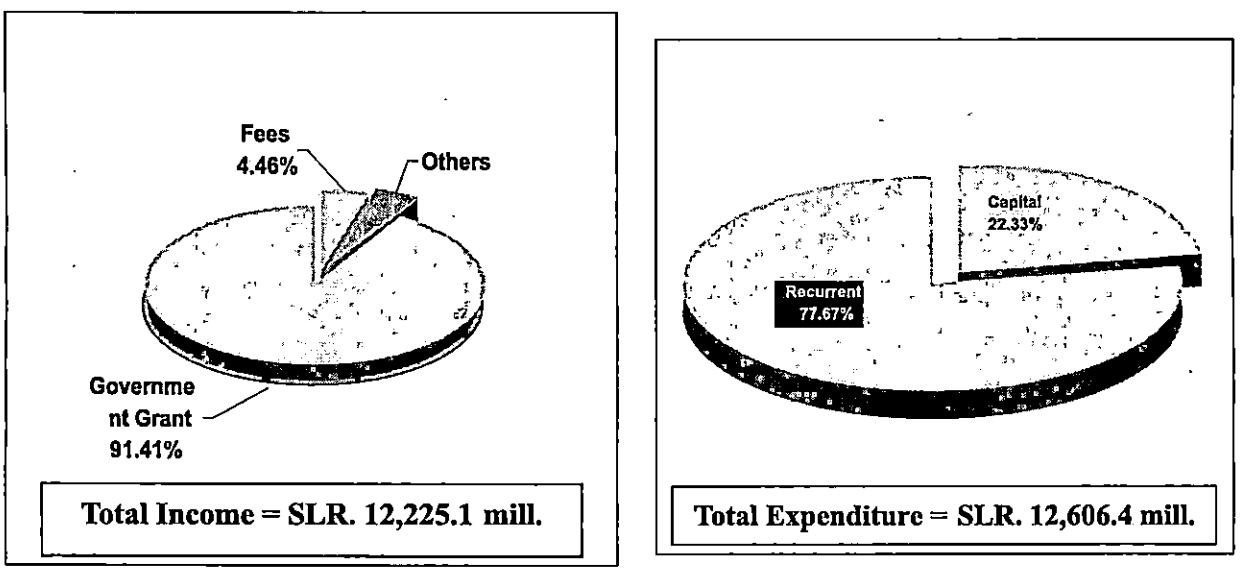


Fig.2: Sources of Income and Expenditure of University Education (year 2006)

In the latest statistical reports, it is obvious that the income of the UGC-governed universities is less than the total expenditure (Statistics -2007/ UGC, Sri Lanka). Therefore, rationalization of these allocations into the collection building of university libraries is also crucial factor that hinders effective user services and questions the evolution of the libraries in the digital era.

As the accumulation of monies alone does not serve to finance the library consortia or networks, academic libraries that operate in a consortium have to seek alternative resolutions to generate income to build their collections.

Libraries themselves must market their services to the private sector for sponsorship and support. Further, they must form lobby groups to foster support from all sections of society (Kaul, 1999). Close rapport and interaction with the society is a must for library consortia to prove their social responsibilities.

4.2 Library collections

Many of the libraries in this study are having relatively an excellent total of their collection. However, the question arises as to how much they are up-to-date and relevant to the voracious user community. There is a gradual increase in the use of electronic resources for which libraries are struggling to renew the subscription.

Table 2: Library Resources and Users at the Academic Libraries

University	Total Collection			HR		No. of Users	Automation			Seating Capacity
	Print Materials	Non-print Materials	Period-icals	Acad. (actl	Non-Acad		Fully	Partial	Manual	
Univ. of Colombo	212,948	600	567	07	42	8420	"			858
Univ. of Peradeniya	392,937	1347	1296	17	98	21,156		"		2028
Sri Jayewardenepura	174,520	1,225	270	08	45	9801		"		1050
Univ. of Kelaniya	144,943	291	205	09	53	20,156		"		742
Univ. of Moratuwa	81,844	795	94	05	31	5401	"			478
Univ. of Jaffna	76,036	281	205	09	38	7101		"		560
Univ. of Ruhuna	123,051	1,727	83	09	39	5588		"		556
Eastern University	66,953	1,098	27	07	10	2033		"		190
South Eastern Univ.	56,157	180	73	04	14	1436		"		167
Rajarata University	54,694	455	148	05	23	1084		"		310
Sabaragamuwa Univ.	81,093	616	96	04	28	2218		"		341
Univ. of Wayamba	25,531	496	298	03	16	2151		"		176
Vis.& Perform.Arts*	38,000	95	20	01	07	2000		"		60
Uva Wellassa Univ.*	7,000	200	-	01	03	800			"	100
Open University	151,289	1,180	83	06	12	2235	"			472
Total	**16,86,996**	**10,586**	**3,465**	95	459	**91,580**	03	11	01	**8088**

Source: Data accumulated from the secondary sources (Statistical Profile of University Libraries-2003 by UGC published in Aug 2007) and Telephone Interviews with librarians.

* Data obtained from the libraries

4.3 Human resources

The data show that number of library staff is below the approved cadre in most of the libraries concerned in the study. Nevertheless, quality of services does not always reliant on the number of staff, but their competencies, motivation, and dedication to the service.

Libraries need to develop education and training to enable librarians to undertake their professional development continuously throughout their careers, e.g. in information management, library networking, library standards, content creation, effective communication, information entrepreneurship, etc. (Kaul,

1999). Consortium-approach to the human resource development (HRD) is highly promising in terms of transfer of technology between participating libraries in a network.

4.4 ICT facilities and other Physical Resources

Automation plays a vital role when it comes to providing quality services, thus, in reaching highest level of user satisfaction. Many university libraries seem not being fully automated nor do they use sophisticated means of information dissemination.

Although some libraries are automated, no matter fully or partially, they have employed different Integrated Library Systems (ILS).

Table 3: Integrated Library Systems and Libraries

ILS System	*No. of University Libraries Using*
LibSys 4	06 (40%)
Alice for Windows	02 (13%)
WIN ISIS	02 (13%)
PURNA	01 (6.6%)
ISURU	02 (13%)
Other Databases	01 (6.6%)

PURNA and ISURU ILSs are developed by indigenous experts and library consortium will have to enhance the usage of these products unanimously across the island. However, there must be benchmarking and further investigations should be carried out to find out the inter-operability of these systems with each other in order to ensure an effective resource-sharing between libraries.

International standards should be adopted by libraries to facilitate the exchange of information within the country and globally and to encourage the development of inter-operable systems (Kaul, 1999). It is important to note here that some libraries are in the process of migrating to more user-friendly, integrated, tailor-made integrated library automation systems (Talagala and Gamage, 2003). LibSys is seen advantageous by many libraries, hence, most of have purchased and installed it on a consortial price basis, financed by the UGC. Library space for storage and seating capacity are also inadequate to build the collection and to render quality services, respectively.

4.5 ILLs and Union Catalogues

Many libraries (86%) stated that they facilitate interlibrary loans, though they allow such reciprocal borrowing. 40% of the libraries compile of union catalogues (UNICAT) and union lists of periodicals (UNILIST) to contribute with information local networks. As to how far the ILLs are effective as far as user satisfaction is concerned is yet to be examined. Personal interviews revealed that librarians face some practical problems even to loan a book to their own faculty and branch libraries. However, UNILIST is effective for the members of SLISTINET who are sharing the periodical articles among the users of the SLSTINET institutions (Rifaudeen, 2008).

4.6 Participation in Information Networks

Participation in information networks is considered to be a professional reputation for both academicians and the institutions. These networks seem to be promoting research and development in their dedicated fields of knowledge. Almost 90 institutions and information centres in Sri Lanka are active members of SLISTINET out of which 12 are university libraries (80% of the total university libraries). HELLIS is an active information network coordinated from the medical faculty of University of Colombo, where University of Jaffna, University of Kelaniya, University of Peradeniya, University

of Ruhuna, and University of Colombo are active members. University of Sri Jayewardenapure, University of Peradeniya, Eastern University, Ruhunu University, University of Jaffna, Rajarata University who teach agriculture are members of AGRINET. All the librarians showed the positive attitude towards cooperative networks. Out of 15 university libraries, 12 (80%) are active members of any networks in Sri Lanka.

4.7 Problems in Resource-Sharing through Cooperation or Consortium

Years back there was initiatives taken to build university library consortia or network. However, it has yet not come into action. Librarians expressed that the major hindrance for not developing academic library consortia is uncooperative attitudes of both libraries and pressures from administrative bodies of the universities.

Even in those local networks where many scientific and technical libraries are participants, cooperative acquisition programmes are not in operation at present due to the uncooperative attitude of the members (Rifaudeen, 2008).

In addition, librarians expressed the following barriers that hinder formulation of consortia among university libraries; inadequate funds, improper infrastructures and ICT facilities, incompetent or less skill in resource-sharing, lack of institutional support and other administrative barriers, absence of cooperative acquisition and collection development policies and formal agreements, and inadequate security to the loaned materials.

5. RECOMMENDATION

The information society is built on a foundation of collaboration and communication enabled by human and electronic networks (Bowden, 1999). With the possibilities of information and communication technologies, digital resources, web-based operations and document delivery, the Sri Lankan academic libraries have the way to move to build library consortia in order to eradicate the barriers that hinder the efficient information services.

As 'attitudes' represent one of the major hindrances to the commencement of library consortia libraries must start by conducting seminars and workshops to make information professionals and university administrators aware of the importance of, and burning need for, collaborative efforts of these types between libraries and their information suppliers.

After having considered problems created by scarcities of library resources and the benefits accorded by geographic proximity, in the beginning, university libraries in the western Sri Lanka will be provided with a consortium model, from the success of which the 15 university libraries will be gathered under one 'umbrella': the Sri Lanka Academic Library Consortium (SLALiC).

5.1 Resource-Sharing Practices

The resource-sharing will be carried out in both conventional and sophisticated ways; interlibrary loans, and means of document supply and deliver, respectively. Interlibrary loans (ILLs) will be executed among participating libraries with the usage of union catalogues and union list of serials. Methods of digital era include; OPACs, z39.50, web 2.0, and MARC formats (Sharif, 2006). These methods will be integrated into the proposed model for the library consortium.

The library that is having relatively a higher level of comparative advantage will be operating as central or pivoting element of the network in the consortium network. The governing body of the monetary flows in the consortium 'umbrella' will be the UGC of Sri Lanka.

In this model, the Library of University of Colombo will be acting as a central body or pivoting element from which the consortium will be coordinated. The UGC is the governing apex of the University Library Consortium. As an initial implementation, six (06) universities will be participating in this network. The major activities of resource-sharing include cooperative acquisition of information resources, cooperative collection development, compilation of Union Catalogues and Union List of Periodicals, exchange of technical expertise, and negotiating with suppliers. These libraries should sign a formalized agreement on the use of library facilities and the resource sharing programme. This will be helpful in defining the nature and extend of cooperation among the participants, therefore, will solve issues like fees and costs, means of communication, copyright laws of the materials photocopied, etc. This model will be expanded to all the university libraries when it reaches its potential success.

5.2 Consortium Initiatives

The Sri Lanka Academic Library Consortium will be set up to provide the following services for the users of participating libraries.

- Developing and maintaining of Union Catalogues and WEBOPAC for both print and electronic information materials,
- Developing the Cooperative Acquisition and Collection Development Policies,
- Ensuring the optimum
- Developing Digital Library for the undergraduate reports, graduate/ postgraduate and doctoral theses and dissertations,
- Initiating a digital library of documents containing indigenous knowledge,
- Developing and maintaining Institutional Repository of scholarly articles and other research publications of graduates, researchers, professors in all universities,
- Conducting human resource development programmes for library professionals and non-professionals, and
- Initiating income-generating programmes, such as fee-levying courses, to foster the consortium to be long-living,

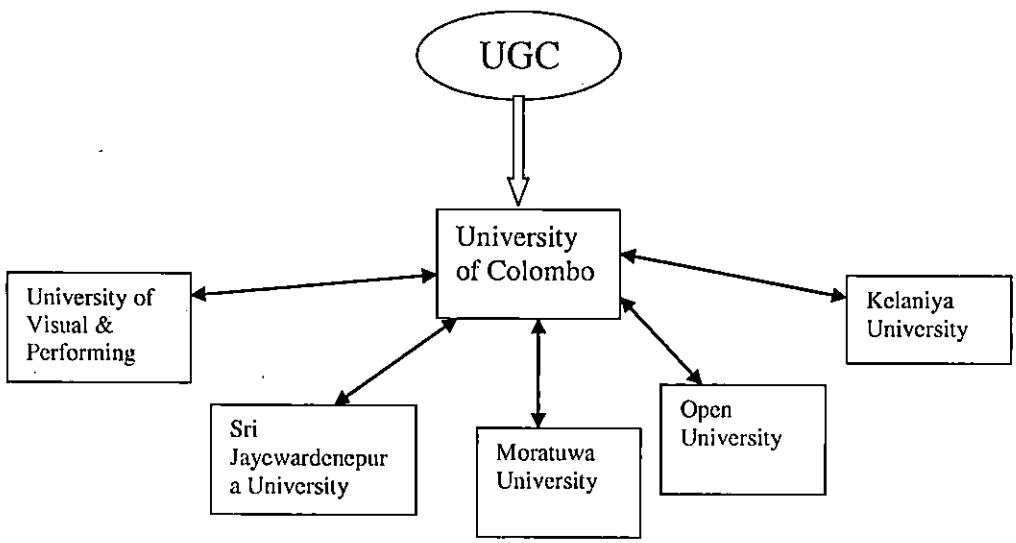


Fig.3: Consortium Model for universities in the Western Province

The above initiatives will be executed effectively in the Academic Library Consortium of Sri Lanka that is to be implemented, with the collaboration of all academic libraries in the country. As the consortium movement has to be introduced slowly an steadily into the university library systems in Sri Lanka, researchers intends to commence with a simple model for six (06) libraries in the western region of the island.

The nation or society which possesses more information will lead the world. This power of information has induced the nations and individuals to acquire and control more and more quantities of information. But, in this race, the poor nations, societies, institutions or individuals will be back as compared to others (Francis, 2005). Therefore, libraries in Sri Lanka must formulate consortia to offer the current information to their users in order to lead in the race with other counterparts in the region.

6. CONCLUSION

Price increases of information materials (hard copies like journal subscriptions and on-line access), reductions in library resources, competition in the information business, ever-increasing user-demands, complexities of requirements for information (i.e. new cross-disciplinary studies) and so forth are piling up pressures on academic libraries in Sri Lanka – as elsewhere. The investigation revealed that the funds for the university libraries are gradually shrinking over the years while the cost of information resources are rising rapidly. Moreover, the demand from library users for new information is also as high as the proliferation of new faculties and departments of knowledge. Although there is a need for initiating library consortia among university libraries in Sri Lanka, the research found that neither effective university library network nor consortium exists. Hence, the study proposes a 'beginner' model for an academic library consortium. Most of the university libraries are participating in local information networks, however, initiation of resource sharing programmes were abandoned due to the barriers such as uncooperative attitude, lack of administrative support, fear of loosing the autonomy, inadequate funds, inadequate available resources, lack of skilled staff, and insufficient infrastructure facilities. The establishment of Library Consortia has proved to be one of the solutions for libraries and information centers around the globe that have encountered similar situations. Unlike university libraries in the developing world, libraries in the developed West are supplementing and reinforcing their incomes through various means such as levying fees, subscriptions, outsourcing, etc. Such solutions are not attractive in Sri Lanka. Nevertheless, they have ventured into co-operation amongst themselves to assist in providing efficient user services. In Sri Lanka, almost 90 percent of education and research are funded by the government, thus, it can establish single consortium for the entire island. Nevertheless, it might be difficult to establish and maintain such a consortium unless there is a unanimous willingness of academic libraries towards library cooperative networks. Resource-sharing through consortia is an effective measure for the provision of extensive access to information with limited financial resources (Sharif, 2006). Library consortial efforts in the US and UK have resulted in many successful library consortia, and these are leading towards their now cogitating about a global library consortium of consortia. In India there are several library consortia are successfully operating to render quality services (Ghosh, 2002). If *Library Consortium* have been found to be the best answers to other libraries and information centres around the globe that encounter similar situations, why can this not be so for the academic libraries in Sri Lanka?

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Managing the Library through Resource Sharing: A new Approach of Consortium for IBS Libraries

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Abstract: Discusses briefly the concept and significance of resource sharing in limited context with a view to justify on the basis of tremendous growth as well as diversity of explicit knowledge, increased user demand, diminished budgets, increasing prices for subscribing periodicals and purchasing books etc. Paper suggests that resource sharing is inevitable among libraries and mentions the concepts, the areas and modalities for cooperation through library consortia in the networked information environment. This paper also covers growth, features as well as different phases to develop the consortia and also the merits and demerits of library consortia with the future prospect of consortia for ICFAI Business Schools.

Key Words: Library resource sharing, Library consortium, Library co-operation.

1. INTRODUCTION

Information is essential for national development. Due to the exponential growth of information in recent years has surpassed the ability of individuals and institutions to cop with it. Libraries are traditional repositories of knowledge, if libraries are to continue to meet the demands of their users, increased cooperation and resource sharing are vital. Resource sharing whether formal or informal is common practice in libraries across the world. The concept started in late 18th century with founding of American Library Association (1876) and slowly gained momentum in the coming decades. It started from shared cataloguing, resulting into OCLC (1967). Then in mid 70's the exponential growth in number of publications and shrinking library budgets due to financial crisis, gave way to concept of cooperative collection. Development and initiatives like research libraries groups (RLG) appeared. This lead to formation of library networks, Forums and consortia at all levels and helped development of the infrastructure for resource sharing by introducing the development of union catalogue, union list of serials and referring and formalizing the inter library loan system (ILL) widening them to state – wide and international levels and introduced concepts like shared access to library members.

2. CONCEPT AND SIGNIFICANCE OF RESOURCE SHARING

Generally, the concept of library co-operation emerged for rendering better services to user's community through borrowing and lending of documents in the formal manner. Library resources are the term that applies to personnel, material, functions or activities available in a library for satisfying the human needs and demands to acquire their desired knowledge. Library co-operation is a very old concept and a form of resource sharing. Resource sharing does not merely mean mutual concept sharing of information resource among libraries, it mean to utilize the information resources of one library for generating services of another library. Information resources and library resources are not synonymous; library resources may include other resources, besides information resources like staff and equipment. Thus resource sharing may mean sharing of all these resources for the mutual benefits of libraries and their users. In this sense connotation of library cooperation and resource sharing will

be almost same. For better utilization of resources, participating libraries should come together and co-operate in two broad areas: (a) developing the collection on shared basis and (b) improving services for exploiting such collection. The conventional libraries are seriously affected by some barriers of information communication, such as indifference of the lending library, conservative attitude, distance, language, cost, and time etc. for inter library loan. So to overcome by these barriers a new approach called 'Library consortium' has developed.

3. LIBRARY CONSORTIUM

It is equally true as well as applicable, for all types of libraries / information centers not to hold the full stock of information resources or to procure all information which may be in demand by its clientele. Even not a single library / information centre can meet the thrust of knowledge of all the readers from its stock of information up to the fullest extent. To solve this problem library co-operation started long ago, such as, library networks, ILL, document delivery, library consortium etc. which are internationally accepted, but at present the more accepted system of resource sharing is library consortia that has come into existence with a wide coverage. This concept is considered to be a metamorphosis brought by the fast changing information environment for supporting better library services through joint actions.

According to Oxford English Dictionary "Consortium means temporary cooperation of a number of powers, companies etc. for a common purpose". It is an association of similar type of organization / institutions who are engaged for producing and servicing the common things / for providing services for a specific purpose of its users. Library consortium is community (a cooperative) of two or more information agencies which have formally agreed to coordinate, cooperate or consolidate certain function to achieve mutual objectives. It is an association of a group of library to achieve mutually the joint benefits. Consortia may be formed on a local, regional, national or international level; on a functional or format basis; or on a subject basis.

4. GROWTH AND FEATURE OF LIBRARY CONSORTIUM

The tremendous information revolution and proliferation have brought about drastic changes to the function and service in all types of libraries in India during last decades. Many libraries in India till today are not in a position to afford to procure all documents and subscribe to core journals in major disciplines or CD-ROM databases, due to their financial crunch. As a result, in India library networks started with the initiatives of NISSAT in forming CALIBNET in 1986, DELNET in 1998 and other networks subsequently to promote resource sharing among libraries. The UGC setup INFLIBNET in 1988. There are many libraries in India have setup consortia among themselves for resource sharing e.g. Astronomy libraries in India. These libraries jointly formed consortia for resource sharing amongst the libraries, such as, Indian Institute of Astrophysics (IIA) library, Inter-university centre for Astronomy and Astrophysics (IUCAA) library, National Centre for Radio Astrophysics (NCRA) library, Nizamiah Observatory (NO) library, Physical Research Laboratory (PRL) library, Raman Research Institute (RRI) library, Tata Institute of Fundamental Research (TIFR) library, Utter Pradesh State Observatory (UPSO) library. The main objective of these consortia are for better resource sharing, to reduce information costs, for speedy delivery of documents, to keep abreast of new development.

4.1 Salient Feature for Library Consortium

a) To eliminate the different problems faced by the libraries to provide various services to the users.

b) To meet the thrust of information of the vast people due to rapid growth of population all over the world.

(c) To cope up with the newly generated knowledge published in different forms, such as print and non print documents, electronic media on various disciplines, multi-disciplinary and new generated subjects areas.

(d) To collect all the documents published at the national and international level, because of the library financial crunch, and

(e) To overcome to language barriers i.e. primary documents are being published by the developed countries like USA, UK, France, Japan etc and among them the non-English speaking countries produce majority of scientific literatures in their mother languages.

5. PHASE OF DEVELOPMENT

We can perform resource sharing process under three major phases

(a) ***Library Cooperation***: This is the first phase of resource sharing where several libraries come together for the mutual benefits of the respective users. In this phase the documents were only in print format and the stress was on use through inter-library lending.

(b) ***Library Network***: This is the second phase; here libraries will link together with the help of ICT (Information Communication Technology). Here also the documents are mainly in printed format, bibliographical databases of the holdings of all the libraries can be accessed from any library and required documents can be procured through document delivery service.

(c) ***Library Consortium***: This is the third phase where the libraries are come together to acquire and share e-resources. In the third phase the documents are mainly in digital format which can be accessed directly by the users of any member library.

6. FUNCTIONS OF LIBRARY CONSORTIUM

Every library differs from one another according to its collection, information needs of users, working method, source of finance, processing of information etc. The various steps of jobs/functions can be adopted by a consortium for functioning standing on a common platform which is:

6.1 Agreement for establishment of a consortium

A concrete agreement needed to be established for the participating libraries in consortia to achieve a common target. Every library will be able to work in such a manner that they are mutually exclusive, but they follow the common mission of a consortium as a whole. As a result, a managing committee should be formed.

6.2 Administration of library consortium

To run the whole functions of a consortium smoothly a statutory body is very much essential to be formed talking Chief Librarian / Chief Information Manager from every library / Information centre and one of them will act as a Chief Coordinator on rotation basis. Each library will inform about their about their collection, databases, user service, training of human resource for handling new equipments etc. to the Chief Coordinator through hierarchical management level.

6.3 Financial control

Due to financial crisis, libraries a consortium for providing better service to the users. The crucial activities of the members of management committee are to take action on the following financial points like:

a) Whether a consortium fund be created to subscribe the core journals in different subjects in multiple copies at a discount price,

b) How to manage the fund of a consortium and how much money is to be collected from each library as a contribution,

c) Whether the participating libraries to whom the responsibility to negotiate with some publisher are vested by the managing committee, will send remittance to the publisher for multiple copies from its own fund and adjust fund subsequently among the participating libraries,

d) What method of accounting standard is to be maintained to avoid any pilferage?

6.4 Joint work

As per guideline of a consortium, individual library will prepare a list of its titles for resource sharing among participating libraries looking into the user demand and may also initiate to contact with different publishers for negotiation. All the participating libraries under library consortia must work jointly just like a joint venture in business sector to make the consortia a total success. Each library will subscribe the core journals and prepare the union list of titles to be covered under resource sharing program and the member libraries may also send full content page service of all issues of the title to another library.

6.5 Evaluation

After a certain period, the whole activities of a consortium (i.e. individual as well as co-operative) must be evaluated on the basis of the pre-determined objective. If there is any lacuna in between the work performed and to be performed should be adjusted by taking corrective measures in activities in future. If there is a need for any change in the path of action, it should be changed immediately to achieve the objective of the consortium.

7. MERITS AND DEMERITS

Every activity contains some merits and demerits. Here are few merits and demerits related to library consortium:

a) A comprehensive collection is possible.

b) Avoid duplication of core collection specially for core journals.

c) Resource sharing will reduce the cost of collection development among the participating libraries.

d) User's demand is considered for collection development.

e) Every library is able to send their respective holding to other libraries under resource sharing program.

f) Easy access to resource sharing on internet by creating databases among the libraries.

Few demerits in organizing a consortium are:

a) Organizing body may charge excessive contribution fee as per their will,

b) There is a great chance of manipulation of fund.

(c) Since, there is no competition; bureaucracy may arise in a consortium.

8. CONCLUSION

The need to share resources in order to cope with the increased flow of information is true in all libraries. The unending responsibility of IBS libraries are collection development, preservation, retrieval of information for providing users service. These responsibilities have become more complex with the introduction of computer and communication technologies in libraries. Any set of objectives will only be achieved, if there is a willingness to join together and to believe that more will be achieved through the efforts of the whole than at the individual level. According to Allen Kent *"the success and survival of libraries will much depend on how much and to what extent the libraries cooperate with each other in future"*. So cooperation is an essential facet of modern library management. Tremendous explosion of information, financial constraints, information in different forms etc. the resource sharing networking has emerged as important alternatives. In the light of the above discussion, establishment of better consortium, integrating intellectual access are all the distinct steps moving towards the 21st centaury libraries. So IBS libraries should seriously rethink and reinitiate consortium movement like western countries for maximum utilization of recourses at a reduced cost, time and space.

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Networking of Karnataka Public Library System

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Abstract: The exponential growth of knowledge due to increase in the number of documents being published in various fields, has caused many constraints for the librarians and libraries. The number of library users is increasing along with increasing demands for information in multidisciplinary subjects. In addition to this, libraries are also facing the problem of escalating price of publications and the multiplicity of information resources with diminishing allocation of funds to libraries, which has made libraries to think in terms of some remedy to overcome these problems. The developments in networking information systems have provided the much needed relief to overcome at least some of these problems faced by libraries for many decades. Thus, the main scope of this study is to study the current status of public library system in the state of Karnataka and to prepare and suggest the network model.

1. INTRODUCTION

Public libraries are instruments of equal opportunity and must provide a safety-network against alienation and social exclusion from technological advance by becoming the electronic doorway to information in the digital age. They should enable all citizens to have access to the information that will enable them to manage their lives at the local level, to acquire essential information about the democratic process and to participate positively in an increasingly global society.

No library would be financially sound enough to be self-sufficient as far as information resources and infrastructure facilities are concerned. The concept of resource sharing becomes the central theme of a networking system. The escalation of prices, lack of adequate manpower to organize the same and the location of libraries at distant and remote places have necessitated the need for networking. The networking of libraries then is one way of achieving maximum results with minimum input. The establishment of the network is important because it has the potential to rejuvenate public libraries. Individuals making use of the electronic resources may also browse the shelves whilst they are there and this makes use of the more traditional library services. The network plans also recognize the core skills of Library and Information workers in collecting, organizing, evaluating and disseminating information to users, and gives them an important role in facilitating the use and development of the network. In addition the library network will play an important part in the Government's strategy to establish and encourage a culture of lifelong learning.

2. PUBLIC LIBRARY SYSTEM IN KARNATAKA

At present, in India, KPLS is one of the most popular and feasible systems, as compared to those in the other 27 states in India. The current situation (as on March 2008) of the KPLS is as under:

1	State Central Library	-	1
2	Indira Priyadarshini Childran Library	-	1
3	Technical Library	-	1
4	City Central Libraries	-	26
5	District Central Libraries	-	29
6	Mobile Libraries	-	15
7	Branch Libraries	-	490
8	Service Stations	-	107
9	Village Panchayat Libraries	-	5766
10	Grant-In-Aid-Libraries	-	21
11	Book Depository Centres	-	2655

Karnataka Public Libraries Act was first conceived by Dr. S.R. Ranganathan and was enacted as early as 1965. At that time it was one of the most modular and feasible Act having a provision for Library Cess and the employees of the Public Library System are paid by the Government directly. Even to day the system is maintaining the same status. Looking at the socio-economic, Scientific and Technological, Industrial and Educational developments in the State, Public Library System has not gained the momentum expected. Karnataka is the Silicon hub of India. The IT application in Public Library System is still in the formative stage. Public Library System can also get the attention in this regard provided the proper perspective is presented to the Government.

3. SCOPE OF THE PROPOSED STUDY

The main scope of this study is to study the current status of public library system in the state of Karnataka and to prepare and suggest the probability and desirability of the establishment of a suitable networking model components with its objectives, functions, services etc. since the Karnataka Public Library System (KPLS) is considered / recognized as one of the best Public Library System in India.

In order to fulfill the proposed objective of the study it would be necessary to study the existing of networks either among Public Libraries or Academic Libraries in India. This would facilitate to achieve and accomplish the network of public libraries in the state of Karnataka with the following objectives.

4. OBJECTIVES OF THE PROPOSED NETWORK OF KPLS

The proposed networking of Public Libraries in the state of Karnataka would

1. Facilitate access to information and library materials for wider audience especially in rural areas.
2. Facilitate effective bibliographic control at the state level (preparation of union catalogue of library materials) and use of information generated in and outside the state.
3. Enhance the nature, quality and types of services.
4. Encourage the exchange of information between and among libraries operating in the State with the help of Information Technology.
5. Achieve standardization among libraries through the adoption of standard bibliographic tools and services.
6. Establish digitization units at the state, district and regional levels for preservation of cultural heritage materials etc.

5. NODAL CENTRE

Networking of public library requires a nodal centre from where the network will operate. So it is necessary to identify the potential nodal center among the public libraries. Hence, State Central Library, Bangalore should be the nodal centre which is in the process of consolidating the technological infrastructure. In this context 5 City Central Libraries are short listed viz. CCL, Jayanagar; CCL, Mysore; CCL, Mangalore; CCL, Dharwad and CCL, Gulbarga. The six libraries are located at different places. Out of six libraries, five libraries are identified as regional centres and one library at the central place acts as a nodal centre.

6. ORGANIZATION OF NETWORK

Taking into consideration of the existing networking system in the country such NISSAT, DELNET and INFLIBNET the model for the public libraries proposed. In the present study an attempt is made to propose a network, as there is no established network available for the public libraries in Karnataka. In order to initiate the study for the framework of proposed network it is desirable to have an ad-hoc committee to explore the feasibility to establish the network and its mode of operation.

In order to make a study to find out the feasibility of study establishing the network to solicit the nodal center in one of the potential library an ad-hoc committee has to be formed. The ad-hoc committee may consist of five members.

1.	Director	Chairman	01
2.	Dy. Director of the nodal centre	Member	01
3.	System Administrator	Member	01
4.	LIS expert	Member	01
5.	Librarian (nodal centre)	Member	01

Further the ad-hoc committee will be responsible to establish the network in one of the nodal centers identified, after the evaluation of the magnitude of the library and other aspects of utility of IT and other facilities.

7. PROPOSED NETWORK MODEL FOR PUBLIC LIBRARIES IN KARNATAKA STATE

The fig. 1 and 2 shows the structure and proposed network model for public libraries in Karnataka State. The model would facilitate easy and direct access to information from the central bibliographical databases housed at the nodal centre. The regional centre libraries shall also interact mutually for enhancing of the required information. Participating libraries can establish link with the regional centre to access resources of nodal centre.

The proposed network model shall consist of the centrally located computer configuration with bibliographic databases of all the participating libraries collection of various types also supported by technical supervision and user services unit. The participating public libraries can directly access the bibliographic databases of regional centre library collection as well as main server housed in the nodal centre.

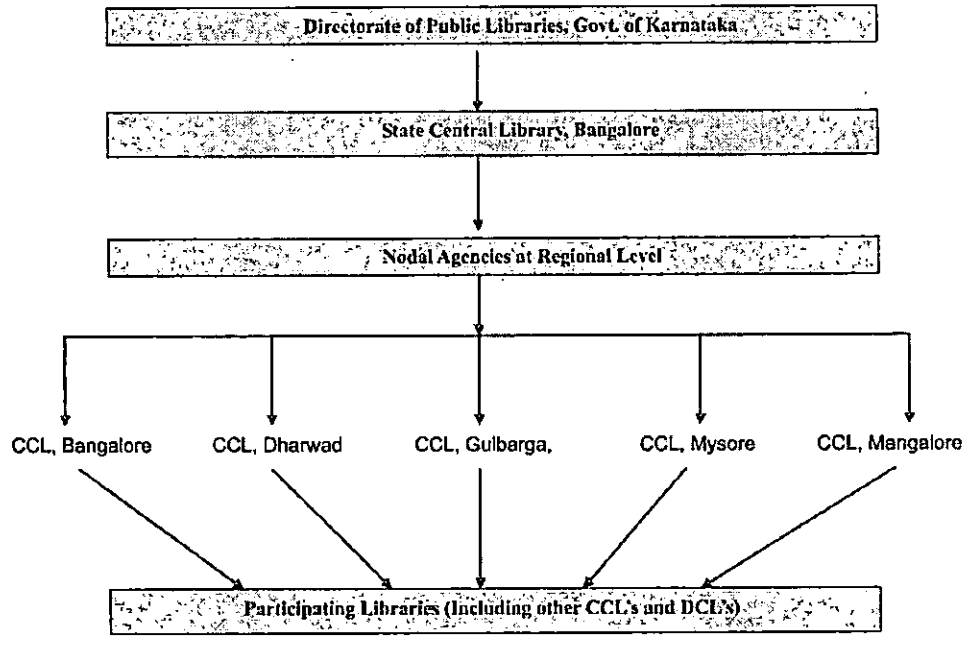


Fig.1: Structure of the proposed Network Model for Karnataka Public Library System

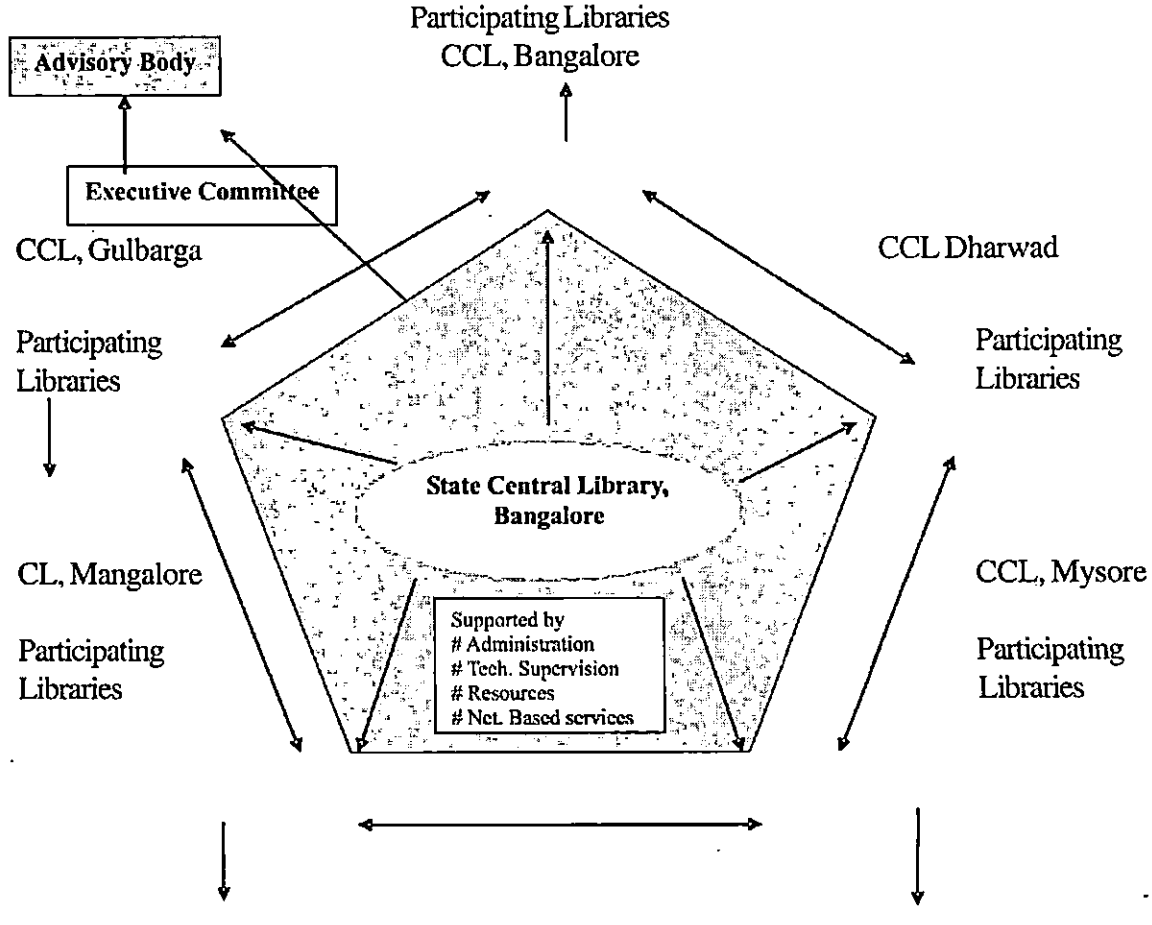


Fig. 2: Proposed Network Model for Karnataka Public Library System

8. BENEFITS OF THE PROPOSED RESEARCH

It is understood that the experience gained in the programme will enable to present a plan of action, substantiating the points to the Government consideration for taking the needful action. Since the State Govt. and the University is very much eager to apply IT in all walks of life, the experience and expertise of the teacher researcher for building up the sound networking of Public Libraries. The realization of significance of information in day to day activities by public is also an important factor to promote the good Public Library infrastructure.

9. CONCLUSION

In the present context the public libraries are the powerful means of supplying the needed information for all. In a democratic country like India, well informed citizens are the assets of the society. Therefore it is essential that the establishing / converting the public libraries as community information resource centers and utilizing the IT capabilities, a good information literate community can be developed.

In addition to the traditional role, the modern public libraries should make use of the benefits of ICT and electronic information resources to keep citizens abreast of the latest developments in their respective professions. The individual of a community have equal opportunities to browse the information superhighway. In a changed environment libraries are pressured to provide a variety of information services. To achieve this, networking of the public library system is the only solution.

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Accelerating School Library Performance: Role of Some Major Enhancers

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Abstract: School education serves as foundation for formal learning & education. School libraries form as an integral part of this formal & innovative learning process. They contribute significantly in enhancing the value of our school education. School libraries being the first layer of libraries in the academic setup, they play a vital role in laying a strong foundation for life long learning. The effectiveness of a school library depends on various factors. This paper brings up, analyses and presents some of main and important factors that contribute to the success of a school library. The major factors being, School management, School Librarian, Government, National Knowledge Commission (NKC), Professional Association. At the end, author presents a few suggestions to be taken up by the apex association for strengthening the current situation.

"Our greatest natural resources are the minds of our children".

-Walt Disney

1. INTRODUCTION

The focus of traditional school education was to acquire, preserve and transmit knowledge. The present day information technology impact on school education stresses on ability to create new knowledge as access to existing knowledge has become very easy. Therefore, there is huge shift from having and knowing - to learning, unlearning and relearning. Mark Twain has rightly said "Education consists mainly of what we have unlearned". We are aware that, India has made huge advances in education in the last decade. It's the youth and the increasing access to educational opportunities that will help in revolutionizing the country's economic progress.

Schools being the foundation of formal education, we need to strengthen them by making all possible additions, be it the best teacher, the best pedagogy, basic infrastructure etc. For a school, to be considered as excellent, it needs to provide learning experiences for students to acquire standard levels of communication skill in each subject taught. Schools need to encourage life long learning and stress on including value system development which will be a base for personal and professional success of an individual. A school needs to be pragmatic and futuristic in its approach, that which continue to determine dynamic perspectives in school education. For achieving this, the school education should consider the library as an integrated part of the system as it gives access to variety of information and resources that fulfill the academic need and interest of student. ".....a well-stocked, professionally staffed school library media center teaches children the importance of literacy skills they need to prepare for higher education and to succeed as adults in information based society." (1)

Just having libraries in the schools is just half the battle won. Mere existence of libraries can not make much difference to the teaching and student learning process. Therefore, to make a difference, it has to be converted to a 'Performing Library'. Performing Library is "that library, which commits itself to its mission, executes each action towards set goals and achieves success in increasing students' achievement". Performance is described as that act, process, or manner of doing or functioning of duty, etc. There are some enhancing factors which will accelerate the whole library performance process. So an attempt is made in this paper to identify these enhancers and the key roles they can play. They are,

- School Management
- School Librarian
- Government
- National Knowledge Commission (NKC)
- Professional Association

Let us examine each of them in detail.

2. HOW CAN SCHOOL MANAGEMENT HELP IN ACCELERATING SCHOOL LIBRARY PERFORMANCE?

As schools are gateways for formal education, they have specific goals based on policies and through effective system execution, coordination, collaboration and achieve social commitments, thus prove themselves as efficient institutions. These factors are same to most schools and are the administrative responsibility of individual schools.

The school management should allocate sufficient space for the library. It should also look in the location of the library, the design of the building, the infrastructure should be convenient and attractive enough to the students as well as the staff to come and use the resources. Secondly, helping build a collection that caters to the curriculum and supports teaching and learning process is a major impact. The management has to allocate appropriate funds and facilitate acquiring various resources. Along with the collection, appropriate technology to access this collection has to be made available. Thirdly, providing every library with the required number of qualified staff is a determining factor. A person with library and information science qualifications can develop, organize and give access to the collection and impart library and information skills effectively.

For smooth functioning of the library, the processes and systems need to be well documented. Management needs to form a library committee with the principal, librarian and academic coordinators as members and take various policy decisions. Drafting mission statement, goals, development plans can be carried out by the committee and documented for future reference. For better usage of the library, the management has to frame guidelines regarding the collaboration between teachers and librarians. Collaboration is the key function for reaching out to students and it is the common goal of the teachers and the librarians. The process, right from the selection of appropriate resources, accessing these resources and interpreting the resources need the coordination and cooperation of the teachers and librarians. Management should encourage communication between them and assure support for this joint effort to increase student achievement. The management should train the library staff to adopt new technological development and soft skills to enhance their services. Last but not the least, management should ensure that all students, staff members and parents have an access to the library and resources during the opening hours of the library.

Having an insight into the role of the school management, we need to examine the role played by the school librarian in enhancing the school library performance.

3. HOW CAN A LIBRARIAN CONTRIBUTE TO A PERFORMING LIBRARY?

It will be interesting to note, who can be termed as a performing librarian. A performing librarian can be considered as the one who has genuine interest in books and reading, has good communication skills, user service attitude and methodical approach. Along with these abilities, one should have

excellent organizing skills, capability to assess user's needs, broad knowledge base and most importantly the patience to handle interruptions when doing work that requires concentration.

Another important area where the performing librarian has to focus is to design and develop material, programmes and events for the students, staff and parents to ensure that the resources are organized in a way that fulfills their requirements as well as encourage them to explore the various other resources for added advantage. One has to do wear many caps at a time that of a teacher, information specialist, programme coordinator, etc. These demand that, the librarian has to be well educated and highly motivated and passionately involved in this noble endeavor.

Some proactive actions that the performing librarian has to take are,

- Be flexible regarding work timings to cope up with professional demands
- Be willing to get trained to update one's soft skills and technological advancements
- Be enthusiastic to network with the staff and other school librarians to share learning experiences
- Be a volunteer to school and student events in order to fulfill the school's mission
- Be innovative and creative in developing services to promote the resources
- Be willing to explore professional associations and be a part of them
- To exhibit one's organizing, initiating and presenting skills to the school management
- To communicate effectively and market library resources, facilities and services at every given opportunity

The School Library Association (UK) believes that "School Librarian has an essential and unique specialist role to play in supporting pupils learning and their development into effective, independent learners and readers".

Those in this arena know very well that school library as such is not very highly relevant and the focal point always. But the librarian can make this possible by developing skills and competencies that enables,

- To be an effective communicator within the institution
- Proactive with colleagues in the organization
- Politically skilful in order to develop and maintain relationships with individuals and take account of differing power bases that exist within each institution

Some managerial roles that a school librarian perform are

- Provider of a major centralized learning service within the school
- Manager of resources (in almost its widest sense)
- Promoter of services and resources (2)

Unlike developed countries, where school librarianship is a specialized area and status and job description is compact, we in the developing countries do not have any cut out role for ourselves and thus, tend to be frustrated. But one needs to motivate oneself and be a part of the new information culture. We need to be excited for the new opportunities that may come our way as libraries are playing an important role in this fast paced IT age.

The president of Carnegie corporation of New York while talking about the 'Power of Libraries' says 'Librarians are often too modest, without any reason to be modest.' He goes on to say 'You are the true alchemists of learning who translate information into knowledge and knowledge into wisdom. And yet, while you are busy promoting knowledge and wisdom, you have not done nearly

enough to promote yourselves and your institutions. You have to sound the clarion call about how remarkable, wonderful, strong, resilient, evolving, central and irreplaceable libraries are to our nation and our citizens'. (3)

We must remember that school librarian holds an equal position among the enlightened group of teachers who make distinct individuals in a physically shrinking world with far more shrinking values. An individual's ability to locate, analyze and reuse information purposefully determines an individual's presence and positive, emotional and mental growth.

Having tried to understand the performing librarian's role one needs to move on to the government's contribution towards school library performance.

4. CAN GOVERNMENT ENHANCE SCHOOL LIBRARY PERFORMANCE?

"Ask me my three main priorities for government, and I tell you: Education, Education and Education". This is what Tony Blair said in his speech at the Labour Party Conference. How very relevant it is for any government to emphasize on education!

To fulfill the goal of Universal Elementary Education, an important programme namely Sarva Shiksha Abhiyan (SSA) was launched in November, 2000 by Government of India in association with the states. The main aim of the programme was to improve the performance of the school system through a community owned approach and to impart quality education to all children in the age group of 6-14 by 2010. Presence of library and its use in all schools has to be one of the criteria to assess the performance of the school system.

Time and again, the National Education Committees and Commissions in our country have emphasized on a well equipped and well managed library that plays an important role in the education of a child. Indian Government frames various policies for elementary and secondary education in general and schools in specific. On the same lines government should frame specific policies for school libraries both in government sector and private sector. We already have National Council of Education and Research and Training (NCERT) which is mainly involved in preparation of syllabi and textbook, but another major function of this agency is policy formulation and standardization of school education. Similarly, a council for policy formulation and standardization of school libraries can be initiated by the government. Withers quotes that 'The three most comprehensive sets of school library standards come from three countries namely, Australia, Canada and the United States where an approach to education, defined recently as "a shift from teacher oriented whole class instruction, where the textbook reigns supreme, to a pupil-oriented situation where the individual child learns actively from an environment rich in learning stimuli" is actively encouraged. So taking a clue from these countries, the government along with other national level accreditation bodies can give guidelines and recommendations to the council to develop standards for various resources now available in the school libraries which are termed as 'Resource Centres" precisely for the availability of varied form of resources. State governments should share responsibilities for facilitating funding to develop collection in school libraries as well as initiate various programmes to encourage school library development. The government can set up committees to review standards and policies every five years to bring in changes and development on the lines of international scenario. The government can instruct the Planning Commission to include school libraries as a separate entity and allocate separate resources for its development.

Having enlisted governments possible initiatives, let us examine National Knowledge Commission, and its key role in enhancing school library performance.

5. CAN NATIONAL KNOWLEDGE COMMISSION PLAY A PIVOTAL ROLE IN ENHANCING SCHOOL LIBRARY PERFORMANCE?

National Knowledge Commission (NKC) was set up in 2005 as a high level advisory body to the Prime Minister of India, with a purpose to guide policy and generate reforms. It aims at developing required institutional outlines to support education system, promote domestic research and innovation and facilitate knowledge application in sectors like education etc. NKC's main objective is to give access to knowledge, skills, imagination and ideas presently and potentially available, or accessible, to the people. Library of India are a rich resource repository. This has resulted in examining the present standards and services of all types of libraries and information centres in order to create systems and organizations that will reach out to the users. The underlying goal is to transform libraries from guarded storehouses of publications into open stockpiles of knowledge. To fulfill this goal various working groups were formed and various seminars and workshops were conducted alongside conducting various surveys. **(4)**

The working group on libraries preliminarily reviewed current services and standards and has recommended the changes India needs. But, the priorities of this working group (on libraries) do not include elementary and secondary education and school libraries as a separate entity which should be done in order to bring in the required change. The recommendations also need to include what factors can give a facelift to school libraries and suggest formation of a professional body to look into the challenges faced by the school librarians and try to bring in uniformity in job description, salary structure and status recognition on par with the teachers. NKC can suggest specialized courses for school librarianship at universities, so that the prospective school librarian can contribute to the school's mission and vision. It also will result in appropriate positions being created. NKC can make its recommendation regarding school library staff structure in order to overcome work overload. It can also develop guidelines for managing various library operations like collection development, facilities and user oriented services, technology implementation to carry out the library operations etc.

Finally, we need to realize that, professional school library association can play a greater role in enhancing school library performance.

6. WHAT CAN A SCHOOL LIBRARY ASSOCIATION DO TO ENHANCE SCHOOL LIBRARY PERFORMANCE?

When a group of like minded people come together for a common purpose in an organized manner, an association of sorts is created. It gives the people a sense of being associated or connected to other people and ideas. When this association engages in specified activities which benefit each and every member, then the association attains the status of a professional association.

One has to consider the benefits of forming a professional association which in turn results in enhancing School Library Performance. Broadly they are,

- It helps in communication between professionals through e-mail, listservs, etc
- It encourages reading for better understanding and writing for publications of the association or sometimes simply for updating one's knowledge base
- One can attend professional conferences and present papers or get enlightened by other papers and presentations
- One can attend training programmes, workshops, seminars or refresher courses conducted by the association and keep oneself abreast of the new developments in the field

- One can look up to the association for solutions and advice in challenging times
- Professional support, policy documents can work as guidelines for upcoming and passionate librarians

If one looks at the some of the major school library associations around the world like International Association for School Librarianship (IASL) American Association of School Libraries (AASL), Canadian Association of School Libraries (CASL), Australian School Library Association (ASLA), School Library Association (UK) (SLA) one can identify some common features which determine the success of school libraries in their respective countries. The features being, a mission statement, a vision statement, strategic planning, well defined roles of the school library and librarian, clearly stated policies on various user oriented services, skills and competencies of the librarian, etc. If in India too, an initiative is taken to form such a professional association, then the school libraries will contribute a great deal increasing student achievement and school librarians will become not just performing librarians but star librarians!

7. SUGGESTIONS

Having made an attempt to identify some major enhancers in this brief paper, certain observations and suggestions have been mentioned below.

- Indian Library Association (ILA) can initiate a dynamic school library association as its sub association on the lines of American Library Association.
- ILA can take up the issue of standardization with the government and bring in uniformity in all school libraries
- ILA needs to identify key professionals who can bring in a fresh lease of dynamic change to the sagging profession
- ILA needs to conduct refresher courses and workshops for school librarians to enhance their skills to suite the ever changing education and information fields
- ILA needs to keep the various other successful professional associations in advanced countries as role models in restructuring their association and its activities
- ILA needs to collaborate with other professional associations for imparting online professional developments courses, etc.

8. CONCLUSION

At the end of the day, how do we look at our school library profession? We label ourselves as an underestimated, under managed profession that has excellent potential for much greater performance but in need of effective and efficient policies and guidelines. The time has come for us to prove ourselves and make our presence permanent. All we have to do is to form a network and enjoy the benefits of coming together, sharing together and growing together professionally. We have the option about how we will handle the acceleration information profession. Our well thought and clearly executed decisions can transform us to a rewarding future.

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Designing of Community Information System Using Google Page Creator

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Abstract: The purpose of this study is to design a community based website which would help to both rural community and the concerned government departments situated in Singanamane. For the same authors has been collected necessary information from all government departments and private service sectors. Collected information has been made available through individual department links. So that in one single window all necessary information can be accessed.

Key words: Community Information Service (CIS), Community website, Singanamane, Agriculture, Fishery, Bank, Irrigation

1. INTRODUCTION

Community Information (CI) may be defined as information for the problems and crises encountered by individuals and their independence at different stages in their lives. It is the information for self-reliance and self-determination. It is the information in the community for the community. The community information services provide quick access to information about essential services in the neighborhood. According to Allan Bunch[1], CIS is Survival information such as that related to health, housing, income, legal protection, economic opportunities, political rights, civil rights etc. Further he said CIS means citizen action information, needed for effective participation as individuals or as members of a group in the social, political, legal, and economic process. It includes basically public policy information such as information about the government, and its operation, programs, plans, schemes, activities, agencies etc. This information at the local level and trans-local level will help community development.

Giggey[2] defines Community as "a group of people who have something common. This can be their age, education, religion, interest, political affiliation, activities, work, possession or a combination of two or more of these." Usher wood[3] defines community in a comprehensive way that "any geographical community or neighborhood will be made up of a number of communities definable by race, social class, or income group, employment, leisure interest, religion and so on, each with its own informal information network that has grown up without the help of librarians or any other information advice workers". Kempson[4] has rightly defined CI as "information of self-reliance and self-determination".

The main objective of the study is to collect the necessary information from different government departments located at Singanamane Grama Panchayat jurisdiction. This jurisdiction has a big water reservoir and some of government departments are functioning in this area viz. P.W.D, KPC (Karnataka Power Corporation), Irrigation, Education, Police, Bank, Agriculture, Horticulture, Fishery, Hospital, Post and Courier and some private community based information centres. For the present study we have collected information from all the departments including public and private service oriented sectors for designing useful community information website.

2. WHY WE NEED COMMUNITY INFORMATION SYSTEM

The following are the striking reasons for establishing Community Information System[5]

- To undertake nationwide, high profile information and awareness campaigns by government of specific social services and welfare issue.
- Increased and targeted emphases on the provision of clear and accessible information for all citizens on their rights, entitlements and supports.
- To avoid duplication of effort made by Village level Workers in different departments.
- According to UNESCO (1994) Public library manifesto we need CIS because of:
- Democracy and Citizenship
- Economic and Social development
- Lifelong Learning
- Cultural and Linguistic diversity
- It provide survival information

3. DESIGNING AND LAUNCHING OF CIS

We're living in fluid and dynamic times. It's easier than ever to travel the world and stay in touch electronically with people who live far away. As a member of the society we're working harder, juggling more roles, and spending more of our time to know more events happening around the world also we are struggling more to get the basic information related to our lives especially policies and programs of different government departments. It is need of the hour to go online for getting information related to our lives, to know the world, to know science and technology, to argue politics, or just shoot the breeze. The Web is becoming our collective town square-more and more, people are turning towards Web to get their personal, social and professional needs. The Net erases boundaries created by time and distance, and makes it dramatically easier for people to retrieve seemingly endless volumes of information from all over the globe. This translates into a tremendous opportunity for community and community Web builders. Considering its importance and awareness about the ICT among the community a small attempt has been made to design and launch a Web site of community information services for Singanamane

4. SOFTWARE FOR CREATING A WEB SITE

There are several Open Source Software's (OSS) available for creating a website, the same can be accessed from a common root URL, the homepage, and usually reside on the same physical server. To create a Web Site one can use HTML editors like Bluevoda, FrontPage, Dreamweaver and MS Word. This model Web site has been created using Google pages creator.

5. STEPS IN DESIGNING OF CIS WEB SITE

The preparation for creating a home page is tedious job and one must have knowledge of HTML, XML, or he/she must have knowledge of working with some web designing software. Now a day, new wave in software products is "open source" every thing is open or freely available along with assistance and tool tip to handle the software's from the software companies. One can easily get the

suitable software's freely and some time the demo versions. Earlier web page designing was a herculius effort for the web masters now due to the open source movement several online free softwares are available. Now one can design a web page with little knowledge of HTML and MS word. For creating this Web Site the following steps have been followed.

- In the first step information/publications are collected from the government departments and private sectors which are required by the community and the same has been arranged logically.
- In the second step identified some related web sites on community information services with the help of Search Engines. The same has been given along with the local information of Singanamane Grama Panchayat.
- Then we collected the URL's of all the departments and arranged it in an alphabetical order and saved it in the MS word format.
- In final step a web site has been designed by using the www.googlepages.com [6]

6. CONTENTS OF THE WEB SITE

To design a simple website/homepage, one need not be a good designer. One can start with a simple design, without harsh colors and graphics. Usually harsh colors and too much of graphics make the web page unattractive and takes more time to get loaded. It is suggested not to put all the information on one page, instead try to make multiple pages and provide links to each other. So that visitors can easily move from one page to another. Since Web site is related to community information services the main focus is given on the following different areas of the community information services.

- Grama Panchayat
- Education
- Agriculture
- Horticulture
- Fishery
- Bank
- Hospital
- Post and courier
- Irrigation
- About Us

7. MODEL WEB SITE MAIN PAGE

The model web site main page clearly demonstrates (figure-1) the main content of the web site, which includes information about the different departments of Singanamane.



Fig.1: Model web site main page

In the main page information about all departments viz. agriculture, horticulture, irrigation, fisheries, bank, education, hospital, business, post and courier, police, MESCOM, KPC and Gram Panchayat has been covered and same have been arranged logically. Just by clicking the appropriate link on the home page one can easily enter into the concerned department page. To limit the number of pages only few selected departments templates and relative contents have been given.

7.1 Gram Panchayat

Grama Panchayat means the Executive Committee of the local level leaders of the village community elected by the publics. It comes under the purview of Panchayat Raj of Government of India. To look after the health, hygiene, family welfare, safety and farming methods and to build the cooperation among the rural individuals Government of India established Grama Panchayat/ Palli Sabha/ Grama Sasan/Village council in all the states of India. This Panchayat acts is a local instruments of the Governments[7]. It ensures greater participation of people and more effective implementation of rural development programs. In this page we made an attempt to show the complete picture of Grama Panchayat of Singanamane. This page contains information about the members of the Singanamane Gram Panchayat, functions of Gram panchayat and Census chart of 2001. (See figure-2)



Fig. 2: Grama Panchayat

7.2 Education

Education is the basic need of every individual. It helps for the all round development of his/her personality. It is the only wealth that cannot be robbed. Learning includes the moral values and the improvement of character and the methods to increase the strength of mind. This page contains comprehensive information on educational institutions situated in and around Singanamane. Apart from this it gives more links to prominent universities and other educational institutions of India. (See figure -3).

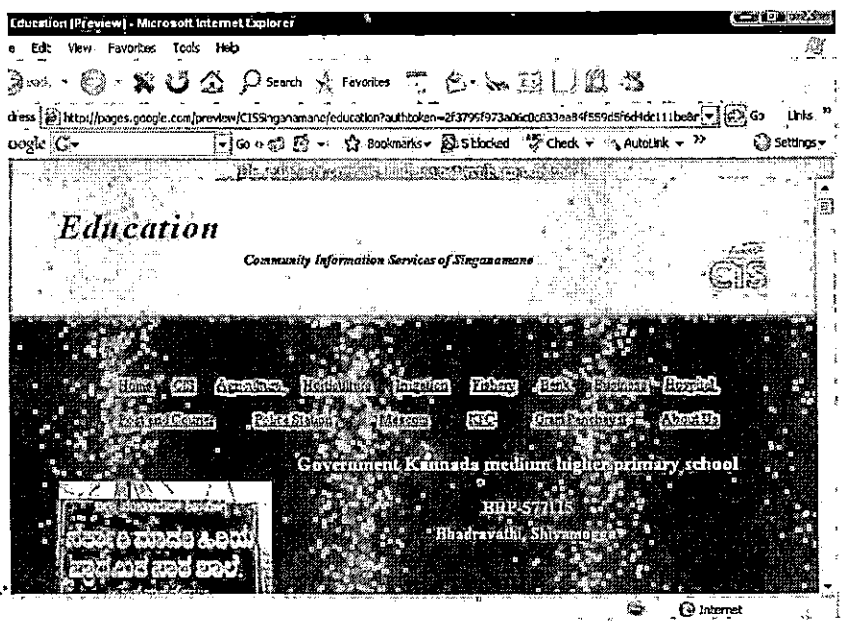


Fig. 3: Education

7.3 Agriculture

Throughout history agriculture has played a dominant role in the development of rural areas. However, the role of agriculture for the future of rural areas is presently under discussion. Although agriculture remains still an important economic activity and important factor for the creation of wealth and employment in many rural areas. Up course its dominant role is declining due to the modernization of agriculture started in the late sixties the number of farms decreased and continues to decrease a lot [8]. Though there is a declining trend still substantial number of people engaged in farming. In this page an attempt has been made to provide agricultural information to rural community. For the convenience of the study this page is categorizes on the basis of some agriculture related areas such as agricultural products and equipments this page acts as a single window for all agricultural products and equipments. Again to provide the links to other agricultural sites, some of the important sites have been identified and evaluated for the authenticity and finally included in the page. (See figure-4).

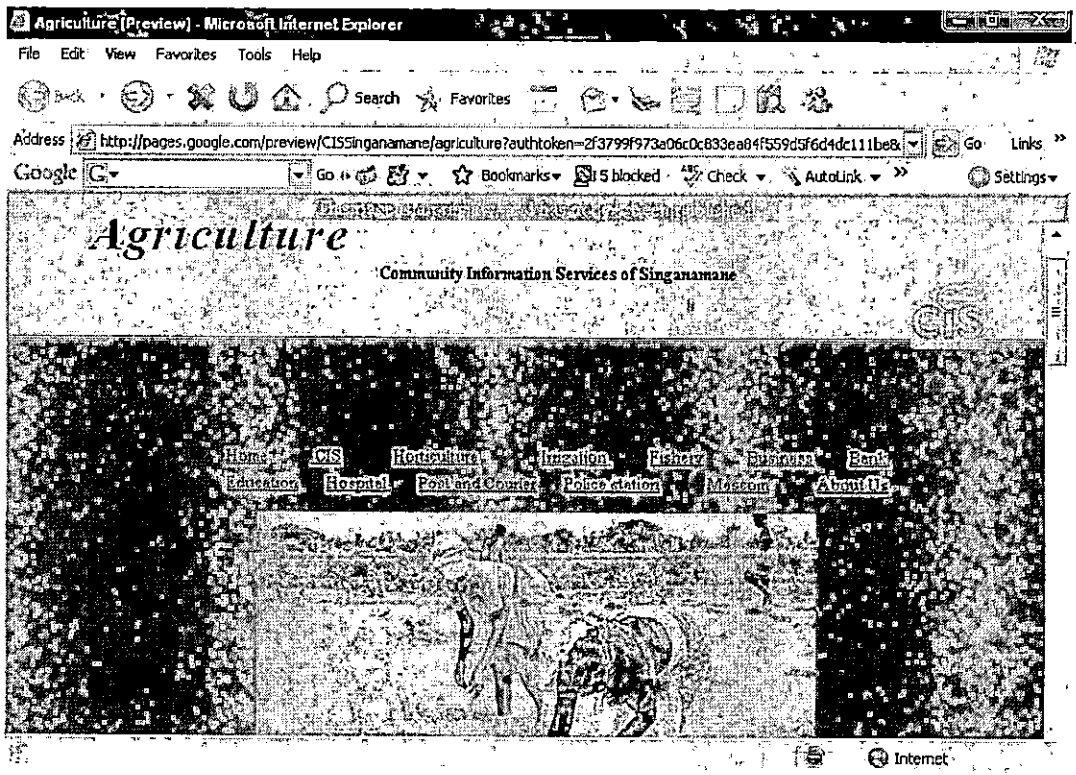


Fig. 4: Agriculture

7.4 Fishery

Fisheries sector occupies a very important place in the socio-economic development of the country. It has been recognized as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries, and is a source of cheap and nutritious food besides being a foreign exchange earner. Most importantly, it is the source of livelihood for a large section of economically backward population of the country. The main challenges facing fisheries development in the country

includes accurate data on assessment of fishery resources and their potential in terms of fish production, development of sustainable technologies. The major thrust areas of fisheries development has been focused on optimizing production and productivity, augmenting export of fishery products, generating employment and improving welfare of fishermen and their socio-economic status [9].

This page provides the local information on fishery department of Singanamane. Our study area is geographically situated near to water reservoir it supports for functioning of three different departments related to fishery. An attempt has been made to provide all the three departmental information along with address, affiliation and activities and responsibility of the department. (See figure-5).

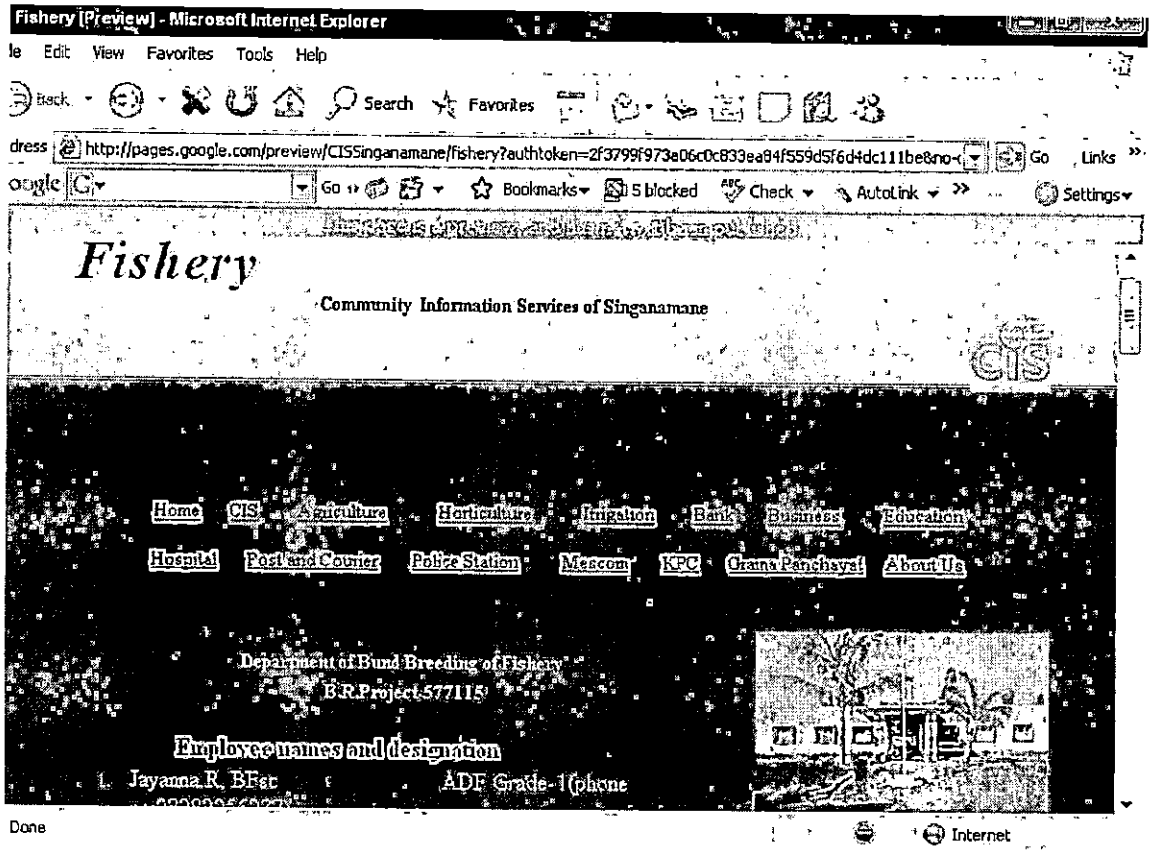


Fig. 5: Fishery

7.5 Irrigation

Agriculture being the main occupation of the state, Irrigation place utmost significant part in obtaining increased yields from the land. The development of Irrigation in the state was slow and unsystematic during the pre independence era. However, there were some notable Irrigation works undertaken and completed during the pre-independence. The Karnataka Irrigation Department is one of the major department in the Government of Karnataka is headed by the Hon'ble Minister for Major and Medium Irrigation. The Department harnesses Surface Water for Irrigation and Drinking Water Purposes [10]. To avail the existing facilities by a larger section of the society comprehensive information on Irrigation Department including completed and ongoing major projects. (See figure-6).

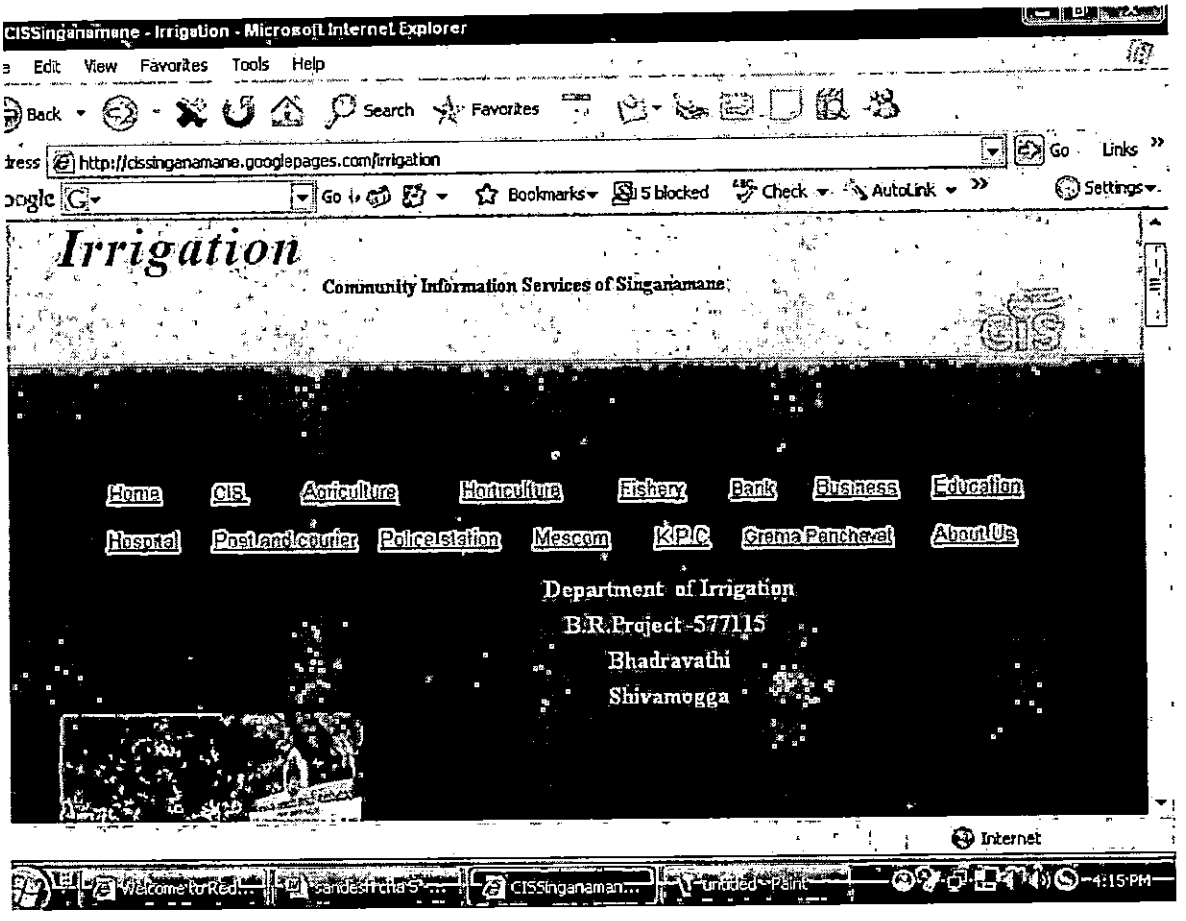


Fig. 6: Irrigation

7.6 Bank

The banking sector has witnessed a huge growth in the recent years. However, despite such a growth, the credit flow by banks to the rural and agricultural sectors remains dismal, which, more or less, has resulted in financial exclusion of the rural masses. The rural and agricultural sectors have to play a very important role if a target of 8% GDP growth per annum as envisioned in the tenth plan is to be achieved [11]. And the banks and the Chartered Accountants have a huge role to play in boosting the rural and agriculture sector through product innovation, broadening the reach.

Singanamane geographical area though it is a rural base but it includes many educational institutions such as university, colleges, schools and government departments functioning smoothly. To fulfill the financial demand of employs and farming community a well set up nationalized bank has been established in Singanamane. This page provides the information related to State Bank of Mysore and its services, working hours and facilities. Apart from the information on SBM an attempt has been made to provide several links related to nationalized and cooperative banks and information on financial matters, Share exchange information, information on LIC and other related links are provided any one can retrieve the information just by one click from this page. (See figure-7).

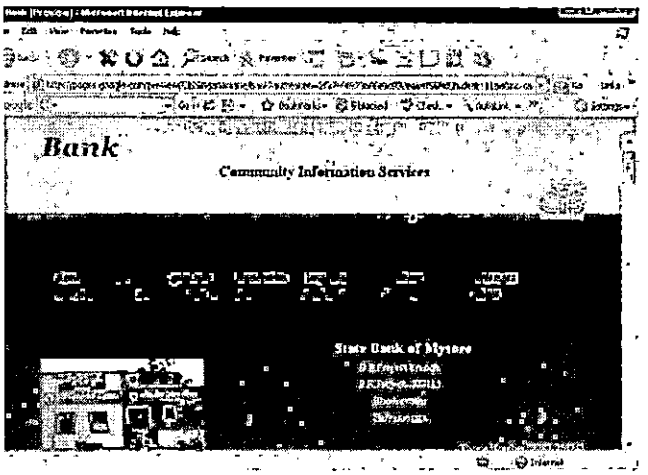


Fig. 7: Bank

7.7 Hospital

The role of hospitals in the community health care system is changing rapidly however; the hospital has been the most effective form of health care delivery in the community. Recognizing the importance of Health in the process of economic and social development and improving the quality of life of our citizens, the Government of India has resolved to launch the National Rural Health Mission to carry out necessary architectural correction in the basic health care delivery system. The entire family welfare programme is being implemented through Primary Health Care system. The Primary Health Care Infrastructure has been developed as a three tier system with Sub Centre, Primary Health Centre (PHC) and Community Health Centre (CHC) these three are being the pillars of Primary Health Care System [12]. In this page an attempt has been made to provide comprehensive information on Health Centers situated in Singanamane region and provide the more suitable links of hospitals to retrieve the required information easily. (See figure-8).

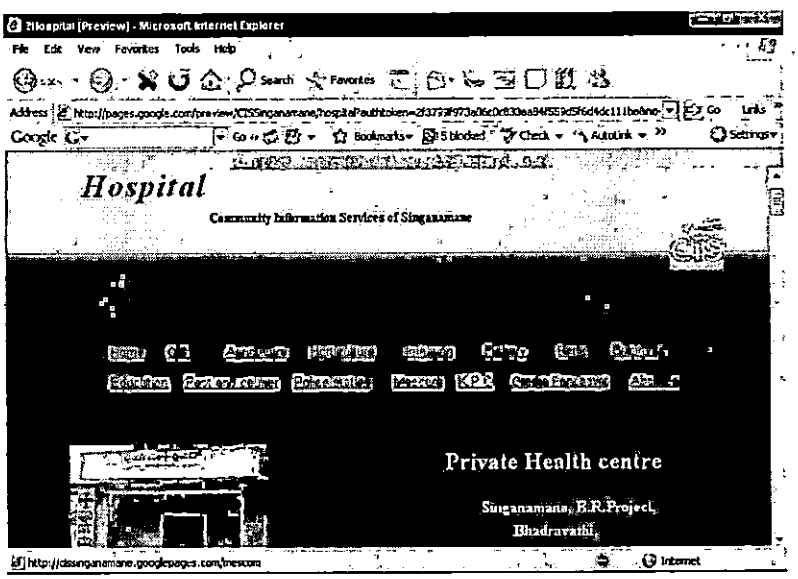


Fig. 8: Hospital

7.8 About Us

This page provides information about our project team. Here we clearly mention the aims, objectives and scope of study. Whereas concern to copyright it is solely on the name of the concerned government departments and this website is continuously updated and evaluated time to time by the project team (See figure-9).

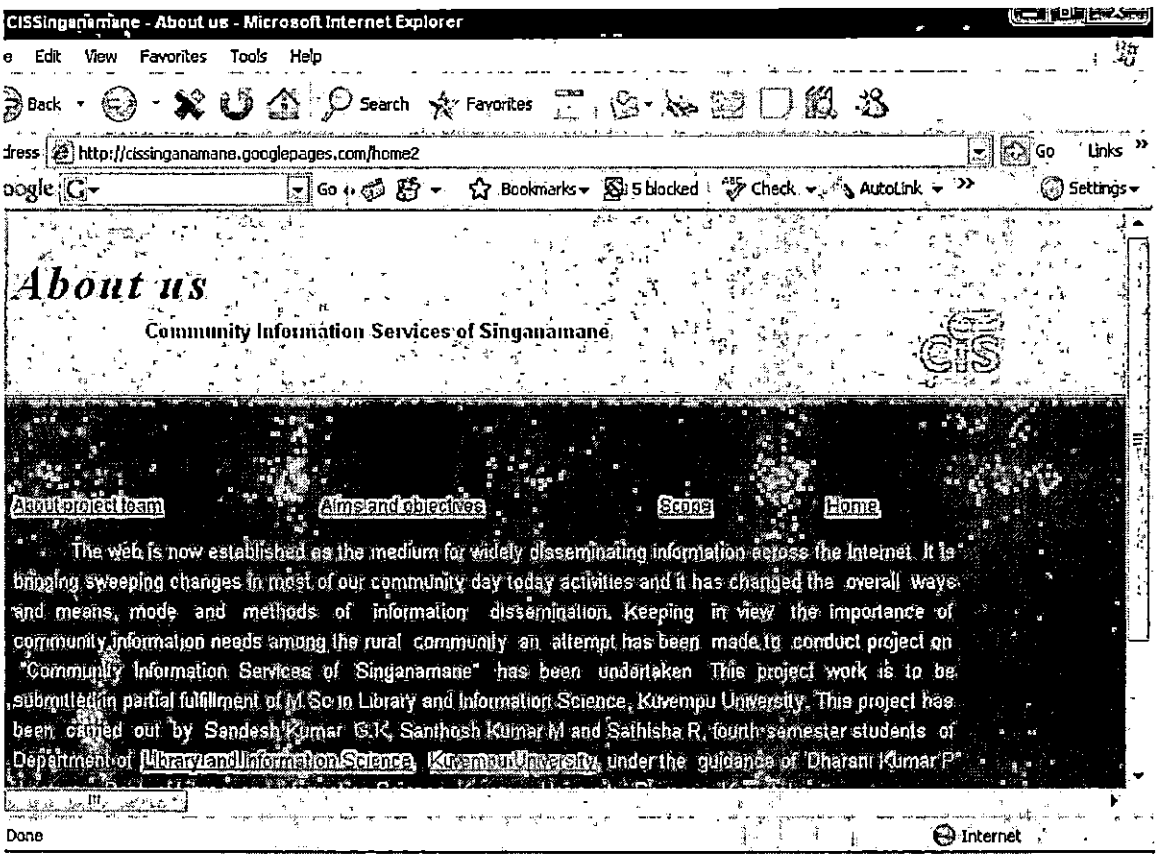


Fig. 9: About Us

8. GETTING WEB SPACE FOR COMMUNITY INFORMATION SERVICE ON WEB

Once we created Web pages on our computer, it has to be hosted on a Web host or also called Web server. A Web server computer always connected to the Internet and stores Web pages. A good number of service providers available on the Internet offer free Web space for developing homepages. The amount of space provided by them varies from each other. Most of these services are *ad based*, i.e., these are sponsored and therefore will have sponsor's advertisement on the site. The advertisement may be a pop-up or a banner. Pop-up means, sponsor's advertisements appear in a new window whereas banner means advertisements will appear in the same window i.e. in the Web site. It is needless to say that the service providers earn revenue from these advertisements. Therefore, while seeking free service it becomes mandatory to accept certain conditions posed by the service providers. These *ads* really will not be distractions and make no much difference as these appear on top of the page

or at a corner of the Web page. However, there are some services without ads too and this should not be the sole criterion for selecting service providers. Main consideration should be the speed, i.e., how fast the service provider's site gets loaded on to the browser and how fast will be the subsequent retrieval. After analyzing free web space providers, the present Community Information Services Web site registered the space from www.googlepages.com. Moreover the main advantage of www.googlepages.com is that it is comparatively speed. The user name appears after the web address of the site on the Internet. It is also known as URL of the Web site. Thus the URL address of this site is http://cissinganamane.googlepages.com

9. CONCLUSION

From the above study we conclude that role of information technology plays a major role in all the spheres of human's activity. The entire world is now a global village. It is essential and an urgent need of all the government departments and service sectors must maintain their own website for effective and timely communication of departmental activities and services to the targeted group. On the other hand Library and Information Centres should also develop their own web page for giving links to all web sites created by different departments so that in single window all need based information can be provided to the users community.

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Information Technology in Public and School Libraries of Developing Countries: Experimental Ventures of India and Kenya

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Abstract: In this paper, benefits that public and school libraries in developing countries would accrue by offering services that incorporate modern IT facilities are envisaged. It recounts promising ideas tried out in India and Kenya, which if developed properly, could benefit significant sections of the populace who mainly reside in the rural areas. Such people would otherwise be deprived of the opportunity to benefit from ensuing value-added information services offered within their respective localities.

Keywords/Descriptors: Public libraries, School libraries, India, Kenya.

1. INCORPORATION OF INFORMATION TECHNOLOGY IN PUBLIC LIBRARIES

By employing modern technology in the delivery of services, public libraries have the added capacity of supplying desired information at faster speeds, in the right form and at the right time. Public libraries need to be increasingly equipped with computers to automate library activities and to make management and administration more effective. Computers acting in partnership with telecommunication technology have the powerful potential of assisting library clientele to share resources, ideas and knowledge online and to communicate seamlessly through the Internet.

On the other side of the coin, users expect library staff manning public libraries to exhibit thorough leadership skills in most aspects concerning the modern technology, once it is in the library. The staff are expected to transmit the same knowledge so that users can be able to use the technology to their greatest advantage. Librarians should therefore be very patient with novice users, since to implement and to understand new technology is a tedious process to both sides.

It is apparent that the contemporary information user happens to be much more aware of his/her information needs as the world becomes more affluent. Vavrek (1995) studied the information needs of the general public in India and identified them as follows:

- Local information/news;
- How to do it information/ reference material;
- Government programmes for development (local, state, central)
- Current information (e.g. radio, TV, train timings);
- Agriculture and related information (technical);
- Programmes of education;
- Legal, medical, health related issues;
- Addresses;
- Crafts, hobbies;

- Travel information (bus, train and air);
- Consumer information;
- Careers, employment (vocational guidance);
- School assignments;
- Political information – biographical data

The aforementioned user-needs are increasing in terms of both intensity as well as complexity. This justifies the need to introduce computers and other emerging electronic forms of information access in public libraries.

Planning for the acquisition of electronic services in public libraries is such an intricate process that all perceived stakeholders need to be deeply involved at various stages as need arises. The stakeholders include policy makers, the librarians, computer professionals, other technical experts, funding agencies and the representatives of the user-groups concerned. At the drawing board, nothing ought to be left to chance, be it the feasibility studies, systems analysis and design, pilot testing, user and staff training, promotion of new products and services, maintenance and upgrading of both equipment together with electronic information resources, the works. It is widely adduced that "one plans to fail if one fails to plan". Therefore, the successful implementation of such expensive and highly technical projects should come only as a result of plenty of man/woman hours of planning. The involvement of the private sector in the implementation is also gaining acceptance. Private firms can be approached to donate equipment or electronic information resource materials. In turn, they may be offered lucrative opportunities of suitably promoting their products and services within public library premises, free of any encumbrances.

Once computerized and empowered with sufficient capacity, public libraries should make real attempts to join various information networks that are available, for the sake of enabling users to benefit from information lying outside the physical "four walls" of the library buildings. In India, several wide area networks (WANs) exist, linking several organizations nationally and internationally. They are connected by means of telephone cables or satellite links or broadcasting.

Some of the networks worth linking up to include: DELNET (Delhi Library Network); NICNET (National Informatics Center); INDONET (a commercial computer-based network commissioned by the CMC Limited); INFLIBNET (Information and Library Network, set up by the University Grants Commission) and the CSIRNET (setup by the Council of Scientific and Industrial Research to provide on-line databases on subjects such as drugs, toxicology, food technology, medicinal plants, electronics, physics, chemistry and other areas). For this purpose, the public libraries should be developed to prepare for joining various consortia, not only to improve value-added services to the library users but also to maximize the resources of the libraries at a cheaper cost. Inevitably this will help to overcome the isolation that public libraries often encounter.

Never the less, the greatest challenge facing public libraries in the advent of electronic information resources is to spearhead the compilation and digitization of information pertaining to the local community in which it is situated. Here the construction of community-relevant databases and consistent management of database content is strongly emphasized and highly recommended.

The onus is on the librarians and information professionals concerned to reach out into the parent community and accurately map out the addresses and functions of all forms of expertise and social amenities available. They should create an annotated database of all agricultural experts, health specialists, veterinarians, electricians, plumbers, masons, carpenters, restaurants, hospitals, recreation

centers, places of worship, real estate agents, transport companies and so on. This type of information could then be digitized and saved onto media such as CD-ROMs or even DVD-ROMs and availed to the public for use, either in the form of hard copy printouts or soft copies viewable on computer screen or saved as files on floppy disks.

2. POTENTIAL MODES OF DELIVERING USEFUL ELECTRONIC INFORMATION RESOURCES TO THE PUBLIC

Admittedly, lack of sufficient financial support has been the main problem facing public libraries in India. Libraries have had to compete with basic services such as health, food, communication and so on. India has generally been faced with rising unemployment, inflation, exponential population increase as well as a looming energy crisis. It is logical that the central government has had to channel more resources from its exchequer to alleviate these problems as opposed to enhancing the development of public libraries.

Notwithstanding, with the help of well meaning friends India can still boast of a number very innovative projects that are guiding lights of things to come, in the line of provision of electronic information services to serve its rural populace. It would be a noble idea if public libraries combined forces with the endeavours described in this paper, all in the effort of demystifying the computer and thereby bringing electronic information services much closer to the people.

Raju (2002) describes the e-seva kendras in the twin cities of Hyderabad and Secunderabad, where the local Andhra Pradesh state government has in place a project called "On-line Transaction Processing" (OLTP). It enables the integrated use of data from various sources and is purported to cover 11 key offices at Mandal level. Public libraries in the area are strongly advised to come forth very powerfully to take up such activities as additional dimension to their day-to-day activities. Among the proposed services of the multipurpose village information kiosks are:

- Birth, death, caste, income, residence (domicile) certificates;
- Grievances and petitions follow-up information (legal aid);
- Applications for power connection;
- Health services and professional information provision;
- Child care;
- Application for welfare schemes like loans and pensions;
- SC/BC housing corporations information;
- Employment applications;
- Women development;
- Information on water related issues and so on.

With such an information kiosk adjunct to a public library with the proper computer facilities, the public librarian would definitely find himself offering novel types of information services that the ones he or she is used to.

An even more exiting project by the name India Development Gateway (InDG) is in the offing (C-DAC Noida: 2003). It is the product of the Center for Development of Advanced Computing (C-DAC) Noida of the Department of Information Technology, Ministry of Communication and Information. It hopes to bring a large number of digitally preserved books to the doorsteps of common

citizens in India, using the practical application of modern electronic-based technology. With its research and training center currently in Bangalore, the InDG is actually a joint initiative of the Indian Government, the World Bank and the Development Gateway Foundation, Washington (USA).

Through the mentioned project there already are two vans on the road in the neighbourhood of Delhi. They are currently loaded with a total of over 10,000 books in languages ranging from English to Hindi to Telugu all available via the Internet. The vans are fitted with powerful satellite connection for direct connectivity to the Internet. They also have fully functional computer units, laser printers, scorers, paper cutters and binding machines for providing bound books to end users from one single point.

The books do not have to be returned since their original copies are safely preserved on a remote server on the Internet and therefore can always be accessed repeatedly. The collection is scanned and the full-text content indexed using Optical Character Recognition (OCR) technology. The books can be searched, selected and printed either in part or whole from a website depending upon the following criteria:

- Language
- Author
- Title

These two mobile libraries are the "humble" beginnings of a fleet of about 30 vehicles planned to roll out to cover the vast country, in future. The initial users of such innovations are schoolchildren and their teachers in rural areas, but the idea could be extrapolated to address the information requirements of rural folk in areas such as agriculture, education and healthcare.

In conjunction with the aforementioned developments, the Digital Library of India (http://www.dli.ernet.in/) is also emerging very strongly.

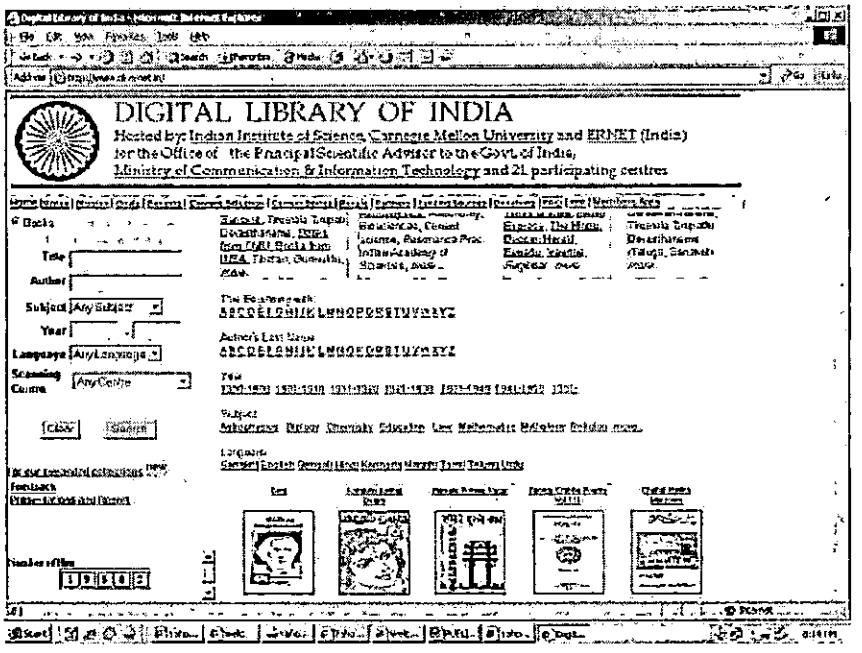


Fig.1: Homepage of the Digital Library of India Website

It is a million - book project, a collaborative effort between Indian Institute of Science and Carnegie Melon University with partners from Government, Academia and Religious Institutions. Approximately 54000 books have already been scanned and 29000 books are available for online access. It is one of the biggest digital library initiatives in India. The objective of this project is clearly mentioned in its mission statement given below:

"The mission is to create a portal for the Digital Library of India which will foster creativity and free access to all human knowledge. As a first step in realizing this mission, it is proposed to create the Digital Library with a free-to-read, searchable collection of one million books, predominantly in Indian languages, available to everyone over the Internet. This portal will also become an aggregator of all the knowledge and digital contents created by other digital library initiatives in India. Very soon we expect that this portal would provide a gateway to Indian Digital Libraries in science, arts, culture, music, movies, traditional medicine, palm leaves and many more. The result will be a unique resource accessible to anyone in the world 24x7, without regard to socioeconomic background or nationality."

The renowned scientist Isaac Newton is credited with having written the following words to his counterpart by the name Robert Hooke, way back in 1676: *"If I have seen further it is by standing on ye shoulders of giants"*. Indeed this statement is valid even today in the era of decreasing competition and increasing cooperation, consortia, partnerships and so on. In January 2004, the India Post in association with the National Informatics Centre (NIC) started a magnificent service called "*E-post*". It was introduced with a view to attempt to bridging the widening digital divide between the information haves and the have-nots. Since public libraries are spread over the vast countryside, we see a lucrative opportunity where they could negotiate to collaborate with the post offices to boost this noble service as surrogate sending/dispatch offices, once they are able to build sufficient capacity.

Through *E-post*, email messages can be sent and received without the sender or addressee having access to a computer or the Internet. The *E-post* messages can also be booked from the local post office or from the computer or office (such as the public library, in this case, by accessing the URL: *http://www.indiapost.nic.in/*) and can be sent to any e-mail ID(s) in the world.

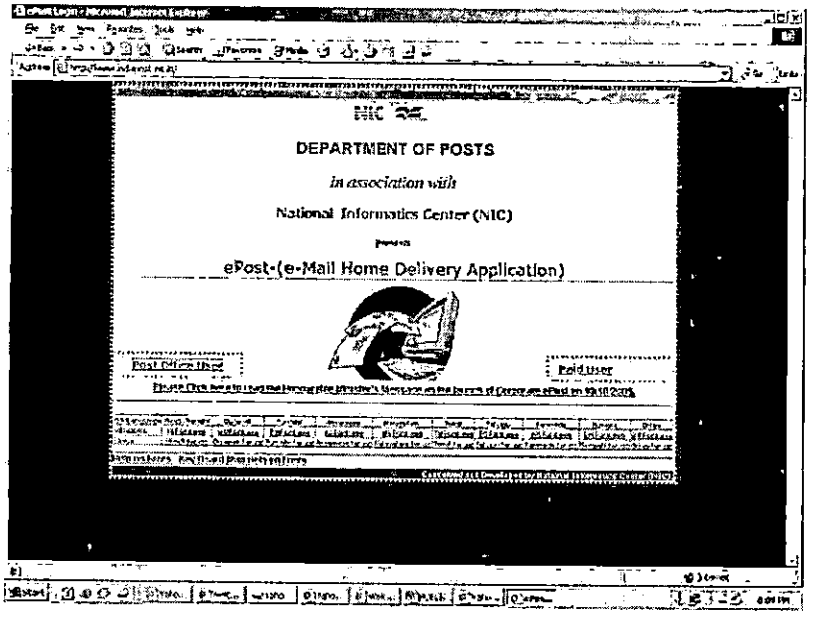


Fig.2: Home page of the E-post Website

Messages can be transcribed in any language and even can be hand written. It also does not really matter whether they contain pictures or graphics. The designated *E-post* centres then scan and use the Internet to convey the messages to the desired destination, via e-mail. The destination *E-post* centers are assigned the obligation of printing and delivering the *E-post* to the addressees through postmen. The only catch is that this service has to be approached with the full blessings of the India Post and that such a library planning to offer such services has to be ready to prove that it has the desired capacity to run them without undue interruptions. This entails the acquisition of state-of-the-art information technology and specialized all-inclusive training for the staff who are to serve the public in this manner.

3. PUBLIC LIBRARIES HELPING SCHOOLS

Children are sent to school with a hope of being transformed into educated and well-informed adults. Most parents know that real education is not confined to the study of prescribed texts only. Children should be thoroughly exposed to the world of books. Swami Vivekananda, the great Indian monk and philosopher, once said, *"We want that education by which character is formed, strength of mind is increased, the intellect is expanded and by which one can stand on one's own feet"*. The achievement of such a noble wish, even in part, is easy where the schools have at least an average sized library. Whereas in Western countries there was a norm of 8 to 10 books per child, studies have revealed that in India, libraries exist in only a small percentage of schools. Unfortunately, libraries are almost absent in primary schools within the country mainly due to scarcity of funds.

In places such as Himachal Pradesh and a few other states, there was a policy under the National Literacy Mission for libraries and reading rooms, where they existed in educational institutions, to be opened to the public in the evenings after school hours. However, this arrangement proved not to be as successful as originally intended. During the recent years, the National Book Trust, Publication Division, the Government of India and other non-profit organizations have brought out many interesting titles at low cost and useful for school students (both in English as well as regional languages). Heads of the schools have had to provide a period a week in the timetable (of all classes) for library work. A representative from the school may collect 50-60 titles from the District Library at regular intervals for use by students during the library period. After a couple of weeks books can be returned to the district library and exchanged for another set of books. This experiment was tried in Andhra Pradesh with some success. The success of scheme depends upon the enthusiasm and teamwork between the District Librarian and heads of schools concerned.

4. PROJECT FOR NURTURING READERSHIP SKILLS IN PRIMARY SCHOOL CHILDREN

Between 1999 and 2003, an impressive project was carried out in a rural part of Kenya (East Africa) with the profound aspiration of preparing young citizens for an information intensive future, thus giving them a hope in a digitally divided world. The philosophy employed was to the effect that: "If the children are not able to come to the library then the library experience i.e. books, educational games, computers and all, must be taken directly to where the children are".

The Reading Tent Project (RTP) was instituted in November 1999 as an outreach programme of the Research and Extension Division at Egerton University in Njoro, Kenya. The Project, then funded by the Rockefeller Foundation based in New York, USA, aimed at promoting a lifetime reading culture

and improving the reading skills of children in a poor locality in Africa. An experimental group of 1,567 primary school pupils in the 4th and 5th standards from ten (10) selected rural schools within Njoro Division and closely monitored for three (3) consecutive years. RTP events involved teaching elementary reading skills. These were interspersed with educational games, modelling, drawing, and painting (Makenzi, Ongus and Nyamboga, 2003).

The project supplemented reading activities with the children being introduced to information technology (IT), namely computers and associated accessories, an assorted collection of CD-ROM "talking books" and supervised exposure to email as well as the Internet. Soon enough, a remarkable improvement in the reading habits was manifested. Moreover, through the project, some pupils managed to establish electronic links to newfound friends abroad, with whom they could share educational experiences.

5. CONCLUSION

Despite the fact that public libraries have admittedly lagged behind in the application of information technology, the unclaimed opportunities that lie ahead for them are vast. State governments and the private sector could promote computer application thereby encouraging a computer environment and the widespread usage of electronic information services in public and school libraries. A lot more players need to be convinced to make a concerted effort to actively support public and school libraries, not just benevolent organizations acting in isolation. Most importantly national information and informatics policy on the development of public and school libraries should be formulated and implemented. Further, an enactment of public libraries legislation is necessary in order to set up an electronic network of public libraries and to enhance proper coordination, moderation as well as standardization efforts contributed by various participants who choose to join the fray. The main beneficiaries of such developments would always remain the clientele of the public and school libraries, majority of them being the ones who reside in the rural areas.

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Public Libraries in the Knowledge Society: An Overview of Karnataka Public Library System

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Abstract: This paper attempts to throw light on the changing dimensions of public libraries and their new role in the dynamic environment of knowledge society. The paper also provides a birds eye view on the development of Karnataka Public Library System, its activities and recent initiatives taken by the department of Public Libraries in Karnataka to cope up with the new environment and to keep itself vibrant to the technological breeze of the Knowledge Society.

Keywords: Public Libraries, Knowledge Society, Karnataka Public Library System (K P L S)

1. INTRODUCTION

Public Libraries occupy a pivotal position among all the public institutions in a modern social system. They play an indispensable role not only in the life of an individual but also act as catalyst in the intellectual advancement of whole community. They promote the proclivity of reading of literature among grown ups, adolescents and children and enhance their horizon of knowledge. The motto of any public library has been to remain as a living force for popular education and to operate as a dynamic instrument of education in the modern society. In a developing country like India, public libraries play a vital role in the educational, social, political, cultural, and economic spheres. Earlier, public libraries were merely considered as storehouses of books and have passed through several stages of development.

Now we are in the knowledge society which is rapidly changing from industrial base to knowledge base and learning services. Information is therefore becoming an ever more valuable and essential resource and the public libraries role as the citizens gateway to information is becoming more crucial, and with the revolution of computer & ICT have made a profound impact on all types of libraries in India including public libraries In this changing environment, the public libraries in India are facing increased number of challenges to keep pace with the newer types of user requirements and also in satisfying the information needs of the whole community. To overcome such challenges it is inevitable for the public libraries in India to develop services based on internet and other advanced networking technologies.

1.1 Definitional Analysis

The public library is aptly described by Carlyle as the "People's University" for its universal character. The Public library is an institution for the people, of the people and by the people. It is for all, without any distinction of caste, creed, colour or sex.

- According to R.N. Chopra "the public library refers to a library which is approved wholly or partly from public funds, and the use of which is not restricted to any class of persons in the community but is freely available to all.

- For the first time Edward Edwards a great champion of public library movement in Great Britain took up the cause of the public library in the year 1849 and emphasized that a legal basis was essential for establishing the Public Library System on a Permanent basis.

In 1994 UNESCO in its manifesto declared

"The Public Library, the local gateway to knowledge, provides a basic condition for lifelong learning, independent decision-making and cultural development of the individual and social groups."

UNESCO in its earlier manifesto (1949 & revised in 1972) had laid emphasis, that

(i) the Public Library should be established under "the clear mandate of law";

(ii) it should be "maintained wholly from public funds"

(iii) there should be no "direct charge" for its any of the services

(iv) it should be, open "for free and equal use by all members of the community", irrespective of their age, sex, religion , language , status or level of education

2. PUBLIC LIBRARIES IN THE KNOWLEDGE SOCIETY

Although the term 'Knowledge Society' is popular and is under discussion all over the world today. But the concept is not new, in earlier days ,Marquis de Condorcet, a French philosopher ,mathematician and scientist , had the idea of Knowledge Society about 212 years ago (1796) in his book titled "Outlines of an human view of the progress of human mind" he expresses that he desired for a joyous, free, knowledge seeking ,moral virtuous society enjoying it as a natural human right. He also expressed democracy as a tool towards spread of education to all , that too without walls of caste, creed and gender, resulting into a knowledge society.

Today, we live in a knowledge society, which is characterized by unprecedented growth of new knowledge , its dissemination ,distribution ,accessibility, globalization of trade ,commerce & business governance, shifting power foci & levels of power and development planning and process of implementation, emergence of new professional class i.e. knowledge workers & their predominant role and many others. However the rapid development of ICT and its impact on almost every aspect of life is the major factor influencing the knowledge society.

In a knowledge society, the levers of development is the creation, circulation and appropriation of knowledge, i.e. non-material processes that in principle may take place anywhere and at any time. The creation of knowledge is no longer the prerogative of formal settings such as schools and work places; therefore the introduction of the term knowledge society is paralleled by a shifting emphasize from education to learning.

The competencies necessary to advance a knowledge society have to do with creative ways of thinking, acting and cooperating so that existing knowledge is not only preserved and stored, but also that new forms of knowledge are developed and new types of action designed. The development of creative competencies is closely related to people's active appropriation of media and ICTs. Online interaction is a necessary means of virtual cooperation and thus e-learning becomes an important concept of the knowledge society. Today it is possible to digitize all forms of information (signs) i.e. text, sound, live and still pictures, which can be important ends of mediatised learning.

Public Libraries can build on these trends by redefining the physical libraries as informal knowledge centers by developing multimodal competencies demanded by the knowledge society without forfeiting the democratic foundation of libraries. However the greatest change in the role of public libraries in

the knowledge society is the development of services based on IT & networking. It may not be possible to predict exactly to what extent the technology will make this information accessible, but there will be a central role for public libraries to create a society that makes the world small and provides information readily and speedily through networking with the use of advanced technology. But the successful service of the public library in the knowledge society depends upon the level of competence of the professionals working, therefore the libraries have to earmark resources for designing in-house IT related training programs for their staff. The range of skills needed by Public Library Professionals includes skills in developing local full-text database, intranet design, designing innovative multimedia based OPAC, electronic publishing, home page creation, internet navigation and browsing. Internet skills and tools for accessing, navigating, publishing and electronic information design. However the Public Library, being essentially a social agency, will have to alter its plans, services and resources as demanded by the social environment prevailing from time to time with the changes occurring in the society.

Ralf B Conant (1967) aptly wrote commenting on the role of libraries in the changing society "Those institutions that move with change and maintain a position of relevance to contemporary problems will fulfill themselves.... Libraries are a facility of increasingly central importance in a society whose knowledge base provides a vital key to future progress and survival as a civilization. How well libraries adapt their various institutional forms to conditions the capacity of library leaders to identify and interpret relevant trends...." This perhaps seems to be very true even today for public libraries in the knowledge society.

2.1 Public Library System in Karnataka in the changing Knowledge Society

The Public Library movement in Karnataka started with a big bang and a great concern to serve the public in promoting the life long education and increasing the awareness of culture, heritage etc. of the land in particular and the world in general.

After the reorganization of states on 1st November 1956 the state of Mysore now popularly known as "Karnataka" came into existence, comprising the five areas:

- Old Mysore State
- Bombay Karnataka
- The Hyderabad Karnataka
- Madras Karnataka
- Coorg

The structure & the pattern of functioning of the public library service existed in all these areas. Each area had its own peculiar features in structure and pattern of working of public library service. However with the enactment of Karnataka Public Library Act in 1965 an integrated Public Library System was established.

The Mysore Library Association took leading part in mobilizing the public opinion in favour of enacting a Library Act. Shri B.V. Baliga (the then speaker of Legislative Assembly), Shri S.R. Kanthi (the then Education Minister) and Dr. S.R. Ranganathan were mainly responsible in getting the Bill Passed into an act within a short period and the Act is a significant land mark in the history of public library movement not only in Karnataka but served as a model for other states in India and elsewhere.

The Department of Public Libraries in Karnataka came into existence on 1st November 1966 consequent upon the implementation of Karnataka Public Libraries Act, 1965.

This Act aimed at the establishment and maintenance of Public Libraries and organization of comprehensive Rural & Urban Library service in the state of Karnataka.

2.2 Salient features of Karnataka Public Library System

- According to the KPLA a uniform public library system is established through out the state, with a State Central Library at the apex , District Central Library at every district Headquarter and establishment of City Central Library for every City having a population of more than one lakh.
- Establishment of Branch Libraries at Talukas, blocks and at Gram Panchayats levels.
- Constitution of Library Authorities at the state ,District & City levels, for the smooth functioning of the libraries.
- Library Advisory Committees are created at Taluk, block, and Gram Panchayat levels which formulate policies and programmes for their libraries and supervise in implementation of them within their Jurisdiction.
- Provision for centralized units like:
  a. Copyright collection of the state;
  b. State Library for the Blind;
  c. State Bibliographic Bureau.
- Provision for the levy of library cess i.e. 6 paise per every rupee on lands, buildings, vehicle registration & profession.
- Creation of a 'State Level Service' bestowing upon its employees all the benefits and privileges as are available to other state Government Services.

3. ACTIVITIES OF THE PUBLIC LIBRARY SYSTEM

A. State Central Library:

It has a organized collection of books & reading materials in various languages, and is well equipped with advanced gadgets, provides services to the blind with the Braille collection, provides employment information, subscribes to good number of journals and magazines and has separate section for Inter Library Loan.

B. City Central Libraries:

As per the Karnataka Public Libraries Act (KPLA) 1965, the Government has established 26 City Central Libraries for providing services to the common people in urban areas.The Bangalore City has been divided into five zones with CCL.

C. District Central Libraries:

According to KPLA 1965, 16 (1) (B), already 29 District Central Libraries along with Branch Libraries are established to provide effective services to the rural community.

D. Mobile Libraries:

It is one of the most popular services of the Public Libraries which intends to provide books at the door to the household particularly to the places where there are no branch libraries in the vicinity.

E. Gram Panchayat Libraries:

There are about 5766 Gram Panchayat Libraries functioning in Karnataka providing services to the rural folk. These libraries help not only to enhance the knowledge of the people but also to make effective use of the leisure time.

F. Children's Library:

A separate children's library known as the Indira Priyadarshinin Library was established in the year 1994, which has a rich collection of books useful for children,with a view to inculcate reading habits among them. At every District & City Central Library a separate Children's section have been created. At every district a Children Community Library has been established.

G. Modernization of Libraries

The Government has provided computers to 29 District Central Libraries and 16 City Central Libraries. And some of which are also provided with Internet connectivity.

H. Cultural Activities:

Public library is the most suitable place to organize cultural activities in collaboration with local cultural organizations, Department of Public Libraries, has been organizing various, cultural and awareness programmes. It also organizes seminars, symposiums, Book Exhibitions, quiz competitions, essay & debate competitions. And every year national library week is celebrated from 14th to 20th November, to create an awareness among the public about the public libraries.

I. Library Training:

The Department also conducts training programmes for the non-professionals in Library Science at the training schools at Bangalore, Mangalore, Dharwad and Gulbarga. The Department also organizes refresher courses, workshops, Seminars etc for the professionals and provides training in the administrative, as well as Technical fields.

Besides, the Raja Rammohun Roy Library Foundation (RRRLF) has been playing a vital role in carrying the Library movement, particularly to the rural areas, of our country. RRRLF has greatly influenced & encouraging the Department of Public Libraries in Karnataka by providing financial assistance in the form of matching & non-matching grants to develop public library services exclusively in rural areas.

4. RECENT TRENDS IN THE CHANGING KNOWLEDGE SOCIETY

The Department of Public Libraries is working hard to computerize its Libraries stage by stage. The technical advice is being sought by the TAP (Technical Advisory Panel) and National Informatic Centre for configuration and other details.

In this direction there are number of proposals from the department that are to be accomplished in the near future.

- To extend the automation facilities to Branch level by utilizing the matching grants of the RRRLF & state Government.
- It is also proposed to introduce OPAC – Online Public Access Catalogue, to provide easy & quick access to the users.
- To provide Internet facilities to all the city, district & taluka level libraries in the state.

- To create a fully functioning and periodically updated website to keep in touch with other library fraternity.
- Recently the first ever website in a state language, that of Kannada, "Suvarna Karnataka Kannada Antharjala Vahini" was devised and launched by the Department of Public Libraries. It provides information about Karnataka history, tradition, language, culture, literature, Government notifications in the Gazette, Cookery, Philosophy, education, entertainment and so on. The main features of this website are that a special page has been included in the portal where all the daily Kannada newspapers are made available on a day to day basis (www.karnatakapubliclibrary.gov.in).
- The Department of Public Libraries in joint collaboration with Carnegie Mellon University (USA) under its Universal Digital Library Project, has initiated for digitization of about 1,00,000 Kannada language books which are to be hosted on the web of the Department of Public Libraries to enable to reach the Kannada readers all over the world.

There are many more such ambitious projects that are proposed and are considered to be under taken by the Department of public libraries in the near future for providing effective and advanced services to the users, particularly the common people in this ever changing society.

5. CONCLUSION

It is rightly said that if a society is unable to cope-up with the new trends or adapt new technology, it will certainly come to a standstill. To cope up with the changing scenario, the Karnataka Public Library System is striving hard to keep itself vibrant to the technological breeze of the knowledge society. But however it is far from picking up volume, velocity and vigour. The obvious reasons are financial constraints, lack of well trained manpower, lack of technical know-how and so on. Therefore, the Government should come forward to formulate a positive and aggressive developmental plan for the modernization of the entire public library system. By harnessing the advantage of technological advances in computers, telecommunications and internet. Such developmental work can be undertaken in phased manner (i.e. from District Libraries to Gram Panchayat Libraries) covering the entire system, catering to the intellectual, informational, cultural and recreational needs of the people of the whole state. And also to make itself relevant in this dynamic environment of knowledge society.

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Public Library Services in Knowledge for all Programmes: Eighty Years Experience in Manipur

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The mode of life of the people (nation) in any region is not an accident but the result of its library development — *Padmashree Prof. S.R.Ranganathan.*

Abstract: Highlighting aspects of knowledge society and indispensable role of libraries in the process of delivery of services for the cause of Knowledge For All programmes this paper attempts to give a picture of the public library movement that took place in the tiny northeastern most border state of Manipur in the Indian sub continent during the last 80 years. Stress has been given towards the efforts made by philanthropists, individuals, voluntary organizations, Government, and role of the RRRLF, etc. The Knowledge For All Programmes conducted in the last eighty years in the state has also been summed up. Concludes with the expectations that implementation of the long pending Manipur Public Libraries Act, 1988 in true sense there will be a new chapter of library movement in the state for the cause of the programme.

Keywords: Knowledge For All; Knowledge Society; Manipur; Public Library Movement; Eighty Years; Depressive scene.

1. INTRODUCTION

Our society has always been in transformation mode. Transformation of the same form agricultural based to information and then to knowledge based is an important dimension. This has led to the formation of a new society i.e.knowledge society where we do live in where emphasis is being given on content creation, distribution and use of information and knowledge in the society and on the development of human capacity. "Connect the World by 2015"- an initiative of the UN at the world summit on the Information Society (WSIS) held in Tunis (November, 15, 2005) aimed to ensure that the benefits of the digital revolution should reach every country and every part of each country by the year 2015. Interestingly that was also a benchmark year for achieving the UN Millennium Development Goals. The International Telecommunication Union (ITU) has recognized India's Mission 2007: "Every Village a Knowledge Centre" as the flagship of the "Connect the World Movement". In this regard libraries in this emerging knowledge society are expected to play a dominant role. In fact, rightly, the India's Knowledge Commission considers libraries as the gateways to knowledge:

- to serve as a local centre of information and knowledge and
- to act as local gateway to national and global knowledge [1].

In this connection, libraries of the new millennium need to be rejuvenated to serve the knowledge seekers of the society in a more effective way.

2. KNOWLEDGE SOCIETY

Present society has been labeled as knowledge society. The phenomenon is global, transcending national borders and territories. Development is dependent upon the ability to capture, share, distribute and manage knowledge. This is equally applicable to individuals as well as to organisations [2]. In this society, knowledge is considered to be the only basic resource around which all the activities of

human beings are centered. It is the key to economic development of individuals or a region or nation. Knowledge can create a comprehensive wealth for the nation. It also can improve the quality of life in the form of better health care, education, infrastructure, other societal needs, *etc.* It has been seen in many countries of the world including countries in the South East Asian Region. The knowledge society can grow if accurate and appropriate right knowledge is accessible freely to people. While the rich are using it for the purpose of wealth creation, the poor can also use it for poverty alleviation using services and facilities of libraries and their similar organisations [3]. In recent decades the progress of nations towards the information and knowledge society has taken on some of the characteristics of a race which in some ways is not unlike the arms race. National governments in many countries have policies or are developing policies to accelerate progress towards the information and knowledge society. They are impelled by the desire to gain competive advantage in an increasingly globalized world and by the fear of being left behind. This may prompt heavy investment in ICTs and in the promotion of information awareness and information literacy among the broad population [4]. Currently, there is a trend towards the use of the term "society" in place of "information society". In the knowledge society, the term "Knowledge" implies a resource that is richer, more structured, more organised, more complex and more qualitative than the term "information".

3. KNOWLEDGE CREATION

In the knowledge society, knowledge is created by a variety of agents as enumerated below [5] :

- Social groups and individuals;
- Social workers;
- Social movements;
- Human actions, especially by getting awareness through learning;
- Individuals and organisations;
- Faculty and students by teaching the tools of academic enquiry;
- Experts in various disciplines;
- Researchers, centres of learning and research centres/laboratories;
- Multidisciplinary project teams;
- Scientists and Technologists;
- Disseminators and Users;
- Indigenous Craftsmen, *etc*;
- Business executives, private sector firms producing explicit and implicit knowledge for sale;
- Domain experts;
- Software interfaces that unearth knowledge without any mediation, automatic knowledge extraction from textual documents in electronic form; and
- Learners who use knowledge bases to create new knowledge, *etc.*

The knowledge so created need to be disseminated to the needy users community for proper utilization.

4. KNOWLEDGE FOR SOCIETAL DEVELOPMENT

The created knowledge in the society is disseminated to use for the overall development of the society. In fact, knowledge is a basic tool for development, as it:

- makes communities sustain themselves from generation to generation and let civilizations grow ;
- induces production ;
- promotes social change and economic growth ;
- gives birth to more knowledge when we study it further through research or in education, Science and technology ;
- makes individuals expand their sphere of influence in any discipline in which they are specializing [6] and finally ;
- brings all round development in the society.

5. KNOWLEDGE FOR ALL (KFA)

In any knowledge society, the dissemination of knowledge should be direct to the society, so that everybody gets the opportunity to access to the same to bring development equally in all sections of the society. As such "Knowledge for All" must be the only slogan for the world of the new millennium. Provision of created knowledge will foster the all round development process of the society.

6. ROLE OF LIBRARIES

Existing library systems need to be rejuvenated to play the role of knowledge centres to serve the society in a more effective and systematic manner. Libraries have been serving as agents, meant for promoting the intellectual and economic welfare of people. As such there is a strong case in favour of establishing them as centres for proper dissemination of knowledge with the development of full and necessary infrastructure. Making networks among the knowledge centres will certainly promote the environment of sharing knowledge freely in the knowledge society.

6.1 Birth of Knowledge Commission in India

The birth of National Knowledge Commission (NKC) [7] in India is a new direction towards making the existing library systems of the country as gateways to knowledge. The idea behind the launching of the Commission is to meet the challenges of globalization and the 21st century. The establishment of the same, has really, changed the modes of knowledge creation, application, management and dissemination in country's perspectives. The overall task before the Commission is to take steps that will give India the "Knowledge Edge" in the coming decades. The Commission has set up the Working Group on Libraries with Smt. Kalpana Dasgupta as its chairperson with the following term of reference:

- Redefine the objectives of the country's LIS Sector;
- Identify constraints, problems and challenges relating to LIS Sector;
- Recommend Changes and reforms to address the problems and challenges relating to the LIS Sector;
- The necessary steps to moblise and upgrade the existing library and Information systems and service;

- Explore possibilities for innovation and initiate new programmes relevant to our national needs to bridge the gap between information rich and information poor;
- Suggest means of raising standards and promoting excellence in LIS Education :
- Assist in getting up facilities to preserve and give access to indigenous knowledge and the nation's cultural heritage;
- Set up adequate mechanisms to monitor activities for securing the benefits of acquisition and application of knowledge for the people of India;
- Examine any other issues that may be relevant.

In this context Libraries of the future, are thus, expected to:

- disseminate knowledge as widely as possible;
- serve as a major vehicle to facilitate creation of new knowledge;
- facilitate optiomal use of knowledge by all sectors; and
- ensure that people from all sectors and all parts of the country have easy access to knowledge relevant to their needs.

6.2 Transformation of Library

In the light of the developments in technology and the emerging needs of the society, the functioning of the library needs to be transformed to a great extent. Suggestions made towards transformation of library include the following:

- Public libraries as the Universities of lifelong learning;
- Upgrading public libraries into Knowledge Centres; and
- Libraries as the knowledge Dissemination Centres.

6.3 Expectations by the Society

The present knowledge Society has been, as understood characterised by the competition, the supply and demand for knowledge to meet the varied and complex needs of the individuals, which are expected from the library. As such, libraries taking the role of knowledge centre need to perform new tasks like:

- knowledge refining;
- spreading knowledge literacy;
- acting as lifelong learning institutions;
- providing substantive knowledge inputs to the wide spectrum of the society covering:
- unemployed and entrepreneurs
- students
- house wives
- labours
- rural masses
- farmers
- senior citizens
- urban dwellers

- physically challenged
- toiling masses of the society
- *etc.*
- Supplying address to relevant institutions, experts, professionals, *etc.*

Besides, libraries of this new society, as expected need to render new kind of services, in addition to the conventional services. Some of the expected new services may include the following :

- Critical evaluation of documentary resources
- In- depth referencing
- Translation
- Career guidance information service
- Networking of experts and professionals
- Activities concerning arts and culture
- Meet the author/writer/expert programmes
- Discussion on burning issues
- E-learning programmes
- Mass awareness programmes, *etc.*

7. EIGHTY YEARS EXPERIENCE IN MANIPUR

In this backdrop, the programme concerning Knowledge For All as taken up by the Public Libraries in collaboration with different agencies in the tiny border state Manipur is associated with the movement and development of library movement. It can be mentioned that the public library movement in Manipur has completed 80 (eighty) long years. During the last 80 years there have been many contributory efforts from different angles for the cause of the movement which can be termed as the movement towards making knowledge accessible to all. The public library movement was started in the state from the side of individuals, voluntary organizations, philanthropist, etc. The initiative of the Government in this regard came a bit late. The following sections of the paper are a narration of the story, highlighting the experience of the last 80 years in the state, in this regard.

7.1 The State -Manipur

Late Pandit Jawaharlal Nehru has described Manipur as ***"Jewel of India"*** and the ***"Switzerland of India"*** by Lord Irwin. Mainland of Manipur comprises of 1, 813 sq.kms of valley areas and surrounded by nine hills. Manipur lying within the latitude of **23.5°N-25.41°N** and a longitude of **93.2°E-94.4°E** is bounded by Myanmar on East, Nagaland on the North, Assam and Mizoram on the West, and Myanmar and Mizoram on the South. Manipur is one of the states in North Eastern region of India having population of 2, 388, 634 (as per 2001 census) in an area of 22,327 sq.km. Manipur has a rich cultural heritage rooted in the ethos of religious, cultural and social customaries of the community since time immemorial.

7.2 History of Library Movement

The very idea of the library movement in this part of the country was conceived in the year 1927 with the establishment of Manipur Club, mainly to provide public library services by ***Dr. H.***

Atulchandra Singh, a Philanthropist, a great social reformer, indeed a multifaceted person of the 20th Century. He was a real pioneer of the public library movement of the state.

The need and importance of library and its role to play in the society was conceived in the mind of Atulchandra since long time while he was studying at Driburgargh and Benarus. He was also very much inspired by the nature of Library Movement launched in Bengal in 1925 by the Bengal Library Association headed by Vishwakavi Rabindranath Tagore as the President of the said Association. He was even communicated with Rabindranath Tagore through letters on some aspects related to social work, art and culture, development of libraries and schools, etc. The dream of Atulchandra became true with the establishment of Manipur Club on ***April 7, 1927*** to provide library services in a formalized manner mostly to the students and youths of the locality and its adjoining areas. The said Club was equipped with books and other important documents developed through donation from the public. The books were mostly found written in Bengali, Sanskrit, Hindi, English and Manipuri. There was even provision for borrowing the books by the public for home use. Eventhough, the name was Manipur Club, it was almost characterized with certain features of being a public library. More interestingly, the said Club was renamed as ***Manipur Club Library*** on the ***1st January, 1931*** by adding the term "Library". Shri Konsam Gulab Singh from Thoubal Melaground, Thoubal was the Librarian-cum-keeper of the Library. After the death of Atulchandra's mother Chonu (Juvabati) in 1932, the name of the library has again been changed to ***Juvabati Memorial Library*** on ***April 19, 1933***.With an august gathering the building of the library having three rooms was dedicated to the public to provide free public library service .The library hosted a number of programmes at that time.

The library also developed literatures on 2nd World War, Newspapers, Radio, etc and the same were made available to the public. Even tale–tale was introduced in the library. Shri Atulchandra himself read out newspapers and made the public listen to it. The Library has got many setbacks through different phases due to many factors. Today the overall management and functioning of the same is under the control of the Manipur Foundation, Imphal.

7.3 Other Pioneering Efforts

After the establishment of the Manipur Club by Atulchandra in 1927, some remarkable pioneering efforts from individuals and general public towards public library movement of the state were also made during 1930-1950. These include the establishment of Imphal Reading Club (1930) at Moirangkhom, Imphal, Chitrangada Library (1934) at Imphal, Imphal Public Library (1934) near Uripok Chakrikom, Imphal, Manipur Public Library (1950) at Bir Tikendrajit Road, Imphal. However, except the last one, all the other libraries became extinct due to many reasons.

7.4 Efforts of the Government

The Government efforts towards the development of public library in Manipur came late with the establishment of District Library and Children Library -cum –Museum in 1958. It was followed by the establishment of Netaji Memorial Library (1968) at INA Complex, Moirang; upgradation of the District Library to the status of the State Central Library (1970); establishment of district libraries in different districts of the state for Ukhrul, Mao (Senapati), Tamenglong, and Churachandpur (1974), Chandel(1977), one branch of the State Central Library at Ningthoukhong for Bishnupur District (1991), Thoubal (1997) and Imphal West and East (2006).The overall affairs of the public library matters in the state is under the supervision of the Department of Art and Culture, Government of Manipur.

7.5 Role of NGOs

The role of different NGOs for the cause of library movement in Manipur cannot be ignored at all. Around such 300 (three hundred) NGOs of the state are organizing libraries with or without assistance from the Government, RRRLF, and other Agencies. They are, as a basic component of the public library system, playing an important role in the movement as well as rendering services to the rural masses.

7.6 Role of RRRLF

The Raja Rommohun Roy Library Foundation (RRRLF), Kolkata has been playing a vital role in the process of development and promotion of library movement in the state, as done in other parts of the country. A separate wing under the name of RRRLF, sponsored by the Department of Culture, Ministry of Human Resources Development, Government of India, was open at the State Central Library, Imphal since 1978.The state started its participation in various schemes of the Foundation since 1981-82 onwards.The Foundation has rendered financial assistance under its Matching and Non-matching schemes. Under these two schemes, the Foundation has provided assistance towards procurement of Books, Almirahs, T.V. sets; Organization of book fairs, Orientation Training Courses, Construction of building for the libraries run by the NGOs. etc. Besides, MALA has been organizing seminars every year under the sponsorship of RRRLF. Previously the State and RRRLF share was in the ratio of 50:50, but now the pattern has been changed to 1:9. As such the role of the Foundation towards development of public library in the state is quite commendable.

7.7 Present Status of Libraries

As per report of the State Central Library, Imphal the Public Library System of Manipur is comprised of 1 State Central Library; 1Branch Library; 9 District Libraries; 215 Club/ Voluntary Libraries the district wise distribution of the same being as below:

Table 1: Public Library System in Manipur

Sl.No.	*Name of District*	*District Libraries*	*State Central Library*	*Branch Library*	*Club/ Vol. orgn. Library*	*Total*
1.	Bishnupur	1	_	1	11	13
2.	Chandel	1	_	_	6	7
3.	Churchandpur	1	_	_	15	16
4.	Senapati	1	_	_	7	8
5.	Thoubal	1	_	_	62	63
6.	Ukhrul	1	_	_	6	7
7.	Tamenglong	1	_	_	5	6
8.	Imphal East	1	-	_	42	43
9.	Imphal West	1	1	_	61	63
	Total	**9**	**1**	**1**	**215**	**226**

Source: State Central Library, Imphal

More than 85% of the total 226 public libraries currently in existence are located in the rural areas of the state. They are, therefore, as expected, to play a vital role in the rural development process of the state serving the rural needs. These libraries are meant for the rural masses. Regular access to the system will certainly benefit them in many respects.

7.8 Emergence of Library Association

The need for an organization to lead the library movement in a more systematic manner in the state has been long felt. But because of want of professionals in the field the real library movement with the support of the people could not be materialized for a long time. The 26th May, 1975 was a remarkable day in the history of the formation of Library Association in the state. On that day, the Manipur Library Association (MALA) was born with Shri M. Anandamohon Singh (then Chief Librarian of the State Central Library, Imphal), Shri R.K. Dave (then Deputy Librarian of the erstwhile Jawaharlal Nehru Centre for Post Graduate Studies, presently Manipur University) and Shri Ch. Radheshyam Singh (former Librarian of Manipur University) as its President, Secretary and Treasurer respectively. However, due to lack of professionals, support of the public, etc led to non-functional of the same. Later, after a gap of 12 years the present Manipur Library Association (MALA) came into being only on the 24th May, 1987 with Shri N. Giridhari Singh, Shri K. Chaoba Singh and Shri Th. Khomdon Singh as its founding President, General Secretary and Treasurer respectively. After the emergence of MALA with the support of the public, the momentum for the library movement in the state has been in increase taking a new shape. Seminars, Conferences, Workshops, Awareness Programmes, Training courses, etc, organized by the Association in the last about two decades could changed the mindset of the people of the state becoming them aware of the need and importance of library in the society. Besides MALA has also been publishing a journal titled ***"Librarygee Ehou"*** (Library Movement), which plays an important role in the library movement in the state.

7.9 Library Legislation in Manipur

As the library movement has speedily been progressed the need to have a sound legislation has also been felt for an effective public library system through movement in the state. Shri Y. Erabot Singh, then Education Minister of the State took initiative on behalf of MALA concerning moving of a Private Member's Resolution on the ***Manipur Public Libraries Bill, 1988*** on the 26th July, 1988 on the floor of the House. As a member of the Business Advisory Committee of the then Assembly Dr. M.Nara Singh, MLA also tried his level best to put up the Bill in the agenda list of the House for discussion. The Bill was passed on the 1st August, 1988 by the Assembly as Manipur Bill No.14 of 1988. There were many controversies over the Bill when the same was sent to the President of India for necessary approval, which was duly corrected. With due efforts of MALA, the Bill was given Assent by the then President of India, Dr. Sankar Dayal Sharma on the 9th June, 1993. The Manipur Gazette published it on the 17th June, 1993 as ***The Manipur Public Libraries Act, 1988*** (Manipur Act No.7 of 1993). The Association also organized a Seminar on ***Manipur Public Libraries Act: Rules and Regulations*** on the 12th August 1993. As an outcome and as the follow-up action of the event the State Cabinet in its meeting held on the 1st July, 1996 approved the Rules of the Act and the same was published in the Manipur Gazette (No. 267 dated the 12th September, 1996) as the ***Manipur Public Libraries Rules, 1996.*** MALA, as such has been very much instrumental in the state towards having a Public Libraries Act. The state thus could become the sixth state in the country next to West Bengal having such an Act. [8]. The same has partially been started its implementation since 1st October, 2002 while Dr. M. Nara Singh was the Minister of Art & Culture of the State.

7.10 KFA Programme

The KFA programme along with the movement and development of public library in this part of the country in the last eighty years can be summed up as below:

- At the very beginning of development of public libraries in Manipur during twenties certain programmes like –reading out of newspapers, tale-tell, story telling, etc were in practice to make the people particularly illiterate know about the current issues, stories, scientific inventions and discoveries, etc.
- Establishment of libraries with the initiatives of Philanthropists and social workers to avail the public access to them.
- Conduct of awareness programmes to make the general public about the importance of library.
- Initiatives taken up by State Government towards further development and establishment of public libraries to expand and reach their services to the disadvantaged sections of the society.
- Involvement of the Non-Governmental organizations towards development and establishment of libraries to serve the local needs.
- Assistance extended by RRRLF towards development and enhancement of public library services.
- Emergence of Library Association to carry out activities and programmes related to library development throughout the state.
- Majority of the people becoming more and more conscious about the importance and value of library in the process of dissemination of information and knowledge.
- Becoming Manipur the sixth state having a Public Libraries Act in the country to render library services effectively, which has its partial implementation since October 2002.
- Steady continuity of development of public libraries to provide services towards covering of all sections of the society so as to make KFA into reality.
- Holding of Imphal Book Fair every year by the State Central Library under the sponsorship of RRRLF.
- Organisation of seminars and conferences by the Manipur Library Association annually.
- Conduct of Library awareness programmes, short term training courses, etc.
- Arranging library related programmes like-symposia, debate, essay writing, quiz competition, etc.

8. CONCLUSION

Many efforts have been made for the cause of library movement to disseminate information and knowledge to the public in the last 80 years and now we are witnessing a depressive scene of the system. However, in spite of different efforts made so far the present scene of public libraries their role towards rendering KFA programmes in Manipur is quite depressive. Issues before us are too many in this regard:

- Priority given to public libraries is very low;
- Existing public library system needs to be improved upon in many aspects;
- Non-implementation of long pending Manipur Public Libraries Act, 1988 in full with true spirit is the main hurdle;
- NGO libraries need to be revitalized to serve the rural masses with the new taste;
- Except a library at Panchayat Bhawan, Porompat, Imphal there exists no library in all the 166 Panchayats of the State, which is required to give emphasis so as to play their pivotal role in the process of rural development.

But, we do also, on the other hand, expect that there will be a continuous progress and development in the near future in the area of public library in the State to develop a new culture of peace and all round development with the provision of Knowledge For All Programme. A new chapter of library development is expected with the full implementation of the long pending Libraries Act in the state in true spirit.

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Role of a Special Library in Teaching-Learning Process: A Case Study of International Institute for Population Sciences Library

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Abstract: The functions of libraries teaching-learning process took different shapes over a period of time due to the improvement of information, communication and computer technologies across the world. The modern libraries are functioning beyond the traditional basic functions of collecting, storing and retrieving documents. The academic libraries are automated to make the students and teachers more comfortable of using Information from libraries. This paper makes an attempt to study the role of a special library in teaching-learning process with special reference to International Institute for Population Sciences Library as a subject-specialized academic and research library. The sources of subject and research knowledge namely general knowledge books, subject-specialised books research articles in periodicals, research papers presented at various conferences conferences/workshops by the faculty members, seminar papers and dissertations by the degree and diploma students, and data sources namely census, large-scale surveys, annual reports both at electronic and print media are analysed. It was found that most of the teachers use data sources and research articles, and most of the students and research scholars use text books and seminar papers and dissertations. Besides, the outside users, especially the school students, find more satisfied of the library services by using the text books of sciences and social sciences and language and subject dictionaries.

Keywords: Special Libraries, Role of Library, Teaching-Learning Process

1. INTRODUCTION

The United Nations and its regional commission, ESCAFE (now ESCAP) had organized a seminar on the population of Asia and the Far East at Bandung, Indonesia in November 1955. It was a historical event as it was the first seminar on the subject of population organized by the United Nations. An important outcome of the seminar was a recommendation that the United nations should take the initiative of setting up a regional training and research centre in the ESCAP region. The Demographic Training and Research Centre (DTRC), Mumbai set up in 1956, was the outcome of the Bandung seminar. Since the establishment of this centre, five other regional centres were established. They are: (1) Santiago in Chile (CELADE- Centre Latino Americano de Demografia or Latin American Demographic Centre), 1957; (2) Cairo in Egypt (CDC- Cairo Demographic Centre), 1963; (3) Accra in Ghana (RIPS- Regional Institute for Population Studies), 1972; (4) Yaounde in Cameroon (IFORD- Institute de Formation et de Recherche Demographiques), 1972; and (5) Bucharest in Romania (Centre de Calcul Statistiques Sanitaires), 1972.

The title of Demographic Training and Research Centre was changed to International Institute for Population Studies in 1970. It was again re-designated as International Institute for Population Sciences in 1984 with a deemed university status. The IIPS is the part of a joint venture of Government of India, the United Nations and Sir Dorabji Tata Trust to work on issues related to population. It was designated by the United Nations as a regional training centre for teaching and research in population and related issues for the countries in the Asia and Pacific region. It embraced the present name and

was declared a "Deemed University" in 1985 by the Ministry of Human Resource Development, Government of India. This is the only Institute of its kind in the world exclusively devoted to teaching and research in population-related areas. Over the last fifty years, the Institute has helped in building a nucleus of professionals in the field of population in various countries in the ESCAP region. Many who were trained at the institute now occupy key positions in reputed national and international organizations. In the teaching programme, the institute presently offers Diploma in Population Studies (DPS), Master of Population Studies (MPS), M. Phil. and Ph.D. in Population Studies. The MPS teaching is conducted both as regular, classroom course and through correspondence. The Institute is also engaged in short-term training of in-service professionals from India and neighboring countries, which are of one- to three-week duration. The institute undertakes a large number of research projects on various aspects of population. The Ministry of Health and Family Welfare, Government of India provides regular funds to conduct policy-oriented research and programme-evaluation studies. Apart from this, the institute also conducts research for state governments, NGOs, and international organizations. The institute regularly organizes a number of seminars, symposiums, workshops and memorial lectures to inform, educate and discuss population- related issues. The institute also provides consultancy services to government and non-government organizations, international bodies and other academic institutions.

The institute's library, jealously maintained over the last 50 years, has a large, specialized collection of books, periodicals and statistical volumes on population and related disciplines. The library is fully computerized and housed in a centrally air-conditioned building. The library collection is available for access through the Internet. The students have the facility to search for literature through the Internet for their study and research. It will be interesting to study the functions of IIPS library distinguished from a general library in an educational institution.

There are different methods of research in library and information science. Taking into consideration the type of research problem, the time at disposal, manpower available, financial resources and the physical facilities available, accuracy required, the researcher has to choose the one which will be suitable to carryout the research. It is a general observation that there is no single research method complete in itself in all respects. (Karande, 1989).

1.1 Role of Modern Libraries

According to Carter, "Library is the heart of the university. Carlyle observes, "The true university of our days is a collection of books. Library is the living force of popular education. UNESCO in its 1949 Manifesto states, "Library acts as spiritual guide and saviour of human soul. It has established itself as a vital organization for human education. Information is gold wherein the magic key for national development lies. But this information can be most efficiently and most effectively supplied only through a well organized network library system by specially trained scholarly people with adequate subject background. Library, by timely disseminating relevant and pertinent information to the persons concerned, can revolutionise the existing educational standard of quality of scientific research. A special library attached to a scientific research organization, helps in generation and dissemination of new knowledge. It plays a distinctive role in the communication system. A research library has to serve a special class of users who are engaged in research and developmental work with great motivation and dissemination for the overall growth and upliftment of the soicio-economic structure of the country" (Sengupta, 1985).

1.2 Definitions of basic concepts

Special library A library that focuses on the interests inherent in the institution it serves. Libraries in hospitals, corporations, associations, museums, and other types of institutions are all special libraries. In many cases, they are not open to the public. A special library's collection may be narrow in scope, but it will have depth within the specialty it covers (www.webliminal.com/search/glossary.htm). A library which is part of a company, organization, or other group. The special library meets the needs of the specialized group. Examples of special libraries are the libraries of Coca Cola and those found in hospitals (www.usg.edu/galileo/skills/ollc_glossary.html). A library serving a special purpose or clientele, eg, a library in a private business, hospital, governmental agency, etc. ODL is a special library. (www.odl.state.ok.us/servlibs/l-files/glosss.htm).

Digital library The "digital library" is not merely equivalent to a digitized collection with information management tools. It is also a series of activities that brings together collections, services, and people in support of the full life cycle of creation, dissemination, preservation of data, information, and knowledge. The challenges and opportunities that motivate an advanced digital library research initiative are associated with this broad view of digital library environment. A digital library should be a seamless extension of the library that provides scholars with access to information in any format that has been evaluated, organized, archived, and preserved. Access to this evolving collection of digital information is provided through personalized systems as well as through the services of information professionals. The digital library adds value and saves time while shifting the times of access. It reduces need for proximity to information resources, but still emphasizes the quality of those resources. It is a library that can be individually customized and, ultimately, will be easy to use (http://scholar.lib.vt.edu/DLI12/defineDL.html).

1.3 Functions of the library

The functioning of a library can be studied under: (1) Staffing pattern; (2) Area of Library; (3) Library collection; (4) Library services. In recent times, the words 'information and revolution' coupled with the third popular term 'globalisation' have brought about a sea-change in our lives fueling the belief that 'we are living in a world of one, ever feer, modern and universal...culture, with an increasingly and beneficially unified political system. This has been further strengthened by the juggernaught of information technology consisting of computers, laser beams, optical fibres and cyber wave in the present millennium. This transition of the society from an economy based primarily on manufacturing to one that is predominantly based on information and the application of information and communication technologies (ICT) has profound implications, shaking the very foundations of traditional librarianship. This largely due to the paradigmatic shift of the library as a place...towards the information to which it can provide access to, a natural consequence of the digital icon replacing the icon of books in modern times. This situation seems to have worsened with the arrival of Internet on the library scene (Seetharama, 2006). The libraries should plan to move in the direction of automation carefully so that they can also join the small section of the Indian community which has began to realize the advantages of data processing technology and the information design. Owing to the explosion of knowledge, libraries have no boundaries these days. Special libraries and information centers are indeed the libraries of the future and pace setters in the real sense of the term. (Sing, 1994). A university library serves students, teachers, academicians, research workers and others. University libraries in NE India renders most of the basic services by traditional methods. The primary reason is that most of the library staff working in these libraries had their degrees from traditional courses. (Prodhani, 1997).

Compurter networks are expected to play an important role in the libraries and LAN will play a major role in development of networks. the future library network should be a local area net work with micro computer work stations for housekeeping or technical services, reader services, shared file storage, shared printing facilities and shared storage of database. This results in closely integrated library services leading to greater accessibility for the community it serves. (Mandal, 1998). The complete process of library software package selection is quite complex and time consuming. In addition to the thourough knowledge of present knowledge system and trends, it also requires the knowledge of available software packages, basics of computers and business tricks to deal with hardware and software vendors. (Mishra, 1999). The accountability and responsibility of the librarians and libraries are unavoidable, while performing the functions of management. Both these are imperative in view of library management in order to boost the entire organizational development of library. (Borse, 2000).

1.4 Types of libraries

Public:	National (National Library, Kolkata), State (Connemara Public Library), Local (Local Library Authority)
Academic:	School, College, University
Special:	By User, By Material, By Subject

Public library which serves the population of a community or region with free of charge or at a nominal fee. (UNESCO's terminology of documentation).

The special library is the product of 20th century. It is directly related to scientific and technological research and industrial development. A library which is devoted for specialized activity such as for the requirements of specialists or of some special institutions is known as special library. A special library, in other words, is devoted to various specific disciplines and subjects. It is for special groups and various organizations.

The following are the chief factors which rise to special libraries.

Explosion of information, in other words, the tremendous growth of specialized literature (books, periodicals and other materials).

Necessity to provide specific piece of information to specific readers (approach to specific information).

Application of the results in research for further growth of subject areas.

The basic objective of the special library is to provide latest information to those who are engaged in promoting the interests of the organization. Since, the users of the special libraries are definite in their purpose and need of exact and accurate information; these libraries are expected to provide exact latest information at the right time. Hence the special libraries exist to provide facts and information rather than recreation and leisure.

The collection of a special library may contain latest edition of books and current journals of the specific field, press releases, reports, working papers, archival material, directories, etc. The special libraries are expected to provide the following services to the special users: 1) to provide photocopying facilities, 2) to provide selective dissemination of information, 3) to provide documentation services like translation, indexing and abstracting, 4) to provide on-line system through computer terminals, 5) to provide bibliographic services, 7) to provide inter-library loan facilities. The special libraries are located in different kinds of institutions, organisations and enterprises. The collection of special libraries

is generally limited to specific subjects or groups of allied subjects. Special libraries may be categories I the following: 1. By user: Prison Library, 2. My Material: Manuscript Library, Thanjavur, Tamil Nadu, 3. By Subject: Central Leather Research Institute CLRI, Chennail. (Dawra, 2003).

2. STAFFING PATTERN OF IIPS LIBRARY

The library has one library and information officer and one Assistant Library and Information Officer and one Sr. Library and Information Assistant to carryout library activities at higher level. There are three library clerks, one xerox operator, four library attendants and 2 sweepers at lower level (Table 1).

Table 1: Staffing pattern of IIPS Library

Posts	*Nos.*
Library & Information Officer	1
Assistant Library & Information Officer	1
Sr. Library & Information Assistant	1
Library & Information Assistant	1
Library Clerks	3
Xerox Operator	1
Library Attendants	4
Sweepers (Attendants)	2

3. AREA OF LIBRARY

The IIPS library is housed in a separate building on the first and second floors occupying an area of 11890 sq. ft. (equivalent to approximately 1105 sq. mt.).

4. LIBRARY AUTOMATION

Advantages claimed for the computerized system are convenience of operation, saving of time and storage of space and ease of expansion to include more features (Srinivas, 1978). Online as a search aid offers particularly valuable capabilities, enabling the searcher to combine unique human talents of those attributes which the computer alone processes. It offers a new quality of search within a new dimension. Online information retrieval will be indispensable to productive research. Scientists must seek to understand and adopt this technology. A return could then be made to the intellectual partnership that is possible between the user and the information retrieval system. (Kaul, 1986). Computer software for library and information work can be categorized in to the following groups: (1) Library management (house-keeping functions): cataloguing, circulation, acquisition and serials control; (2) Management support: statistics, MIS, accounting, budget control; (3) DBMS and Information retrieval: data base creation, searching, generation of information products like CAS, SDI, indexes and bibliographies, thesaurus maintenance, and directory generation etc. (Rajashekar, 1986).

5. CLASSIFICATION AND CATALOGUING SCHEMES

The library uses the Dewy Decimal Classification (DDC) 18th Edition and Anglo American Cataloguing Rules (AACR).

6. LIBRARY SERVICES

Reference service

Reprographic service

Inter-library loan service

7. DOCUMENTS

The documents of the IIPS library are broadly classified into three major categories namely books, journals and reprints. In total, the number of documents from the year 1957 to 2007 shows a constantly increasing trend from 6.4 % to 52.8 %. The number of books is more followed by reprints and journals (Table 2). The number of social science documents is more followed by family welfare and generality (Table 3).

Table 2 Number and percentage distribution of documents from 1957 to 2007

Year	*Books*		*Journals*		*Reprints*		*Total*	
	#	%	#	%	#	%	#	%
1957-1966	8762	6.3	506	4.7	2087	7.2	11355	6.4
1967-1976	17973	13.0	1721	16.0	3118	10.7	22812	12.8
1977-1986	18121	13.1	3178	29.5	4999	17.2	26298	14.8
1987-1996	16518	11.9	4040	37.6	3110	10.7	23668	13.3
1997-2007*	76879	55.6	1310	12.2	15816	54.3	94005	52.8
Total	**138253**	**100.0**	**10755**	**100.0**	**29130**	**100.0**	**178138**	**100.0**

Note: * As on December 2007.

8. LIBRARY USERS

The library users are classified into four categories namely (1) faculty members, (2) staff members, (3) students, and (4) others- retired faculty (Table 4).

Table 4 : Distribution of users

Users	*Number*	*Percentage*
1. Faculty members	29	11.6
2. Staff members	118	47.4
3. Students	79	31.7
4. Others	23	9.2
Total	**249**	**100.0**

9. LIBRARY BUDGETING

The library/document and information system should have its own separate budget instead of the current practices of being lumped with other divisions. Funds approved for library/document and information services should be strictly used for this purpose only. There should be a budget committee for co-ordinating various functions and co-operation, and the head of the library/document and information center should be involved. The financial requirements of the library/documentation and information services offered and services proposed. The library goials and objectives should be

established for the forthcoming year and funding requests should be related to library objectives. (Kar and Siddiqui, 1990).

10. CONCLUSION

The IIPS library has multifaceted roles in the teaching and learning processes. Though this library has specialised documents on population studies, it has complemented and supplemented by other social sciences like sociology, anthropology, economics, geography, etc. Among journals and other publications, the UNO related ones add the quality to the collection of the library. The data sources like census of India and other countries, UN Demographic Yearbook, NSSO, Registrar General of India and CSO publications, and also the population related encyclopaedias and dictionaries are quite useful for the teachers to carryout both their teaching and research activities. The textbooks, UN manuals, seminar papers, dissertations and research articles are very useful for the students. Both the teachers and students vehemently use the electronic media for retrieving and analysing the data for their research works.

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Status of Primary School Libraries in Karnataka with Reference to Davangere District: A Study

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Abstract: The learning at the childhood will be the base for higher learning. Therefore it is needed to provide attractive informative resources which enable to create or motivate systematic reading culture, reading habit among the school children. The primary school libraries, in this stage of children come forward to build them into well informed personality. The school libraries especially Primary School Libraries (PSL) are the grass root libraries for all the libraries in higher educational institutions. They should thus be treated as the fulcrum for the libraries in colleges and universities. This study investigates present status of primary school libraries in Karnataka with special reference to Davanagere District Libraries by using questionnaire method and finds out the status of collection, its problems analyzed with tables and finally ends with valuable suggestions.

1. INTRODUCTION

The school level from 5th to 7th standard is one where the boy or girl starts to learn through reading the books and other informative (materials) sources, without knowing that the reading is the base for acquiring knowledge. The child even doesn't know what is knowledge, what for it is, and so on. "Flower which is waiting to get fertilize" it is the stage budding to become a resourceful personality by understanding the world of knowledge, acquiring it, through reading the sources of knowledge. The knowledge acquired at the childhood will remain (or useful or helpful) until the end of life. "Knowledge learnt at childhood remains for ever" which specifies that the one who learns at the age of three years will continue till his hundredth years.

This is clear that the learning at the childhood will be the base for higher learning. Therefore it is needed to provide attractive informative resources which enable to create or motivate systematic reading culture, reading habit among the school children. The primary school libraries, in this stage of children come forward to build them into well informed personality. The school libraries especially Primary School Libraries (PSL) are the grass root libraries for all the libraries in higher educational institutions. They should thus be treated as the fulcrum for the libraries in colleges and universities.

"As is the root so is the Fruit". Here root is the primary school libraries; fruit is the child's knowledge or resourcefulness. As the school libraries build library culture among the children, so the child becomes resourceful. Further it is to note that as the child at this level cultivates library culture and awareness about library services, the libraries of higher education will be more used or functioned. Hence the study is undertaken to understand the status of Primary School libraries in Karnataka by studying the primary school libraries in Davangere District.

2. OBJECTIVES OF THE STUDY

The main motivation behind this study is to extract the following objectives. Such as:

1. To understand the present status of primary school libraries.
2. To identify the types of sources acquired and method of preservation.
3. To identify the services rendered to the children.

4. To identify the usefulness of the services.
5. To know the problems in Primary School Libraries.

3. METHODOLOGY

The questionnaire method is used to collect the data required for this study. The simple questionnaire is drawn for a teacher who looks over the primary school libraries and the information obtained from Ninety teachers of selected Primary Schools in Davangere District. The schools are selected randomly i.e. 25each from Government L.P.S, H.P.S, & Private H.P.S and 15 from Private aided schools. The questionnaire consists of question on collection method of sources, the preservation system, infra structure facilities, services rendered, children's attitude in using the books, their reading habit, problems faced in maintaining and rendering service and finally suggestions for upgrading the primary school libraries. Before going to understand the above, let us understand the area of the study.

4. DAVANGERE DISTRICT

Davangere District is housed in the central part of Karnataka State. It is located in between Malnad belt of Sahyadri Hills at the south and Bayalunadu (Dryland) area at north. It is 265 KM away from Bangalore-the capital city of Karnataka. The district is newly formed in the year 1997, consists of Six Taluks having more than 11 lakhs of population. Great writers like Baguli Deva Kavi, Beechi & Dr.H Thipperudraswamy, great politicians like Kondajji Basappa, H.S.Rudrappa, J H Patel - the former chief minister of Karnataka and Harapanahalli Bheemavva – folklore artist were the prominent personalities of the District. The District has rich cultural and historical heritage.

4.1 PRESENT STATUS OF PRIMARY SCHOOLS

The present system of education in Karnataka starts from baby sittings followed by Lower Kinder Garten (LKG), Upper Kinder Garten (UKG) and then Primary School (PS) system and so on. The PS system consists of two categories, such as Lower Primary Schools (LPS) from 1st to 5th standard and Higher Primary Schools (HPS) from 6th to 7th standard. It is observed that though the HPS consists of 6th & 7th standards, all primary schools from 1st to 7th standards are also called HPS. But only the schools consist of 1st to 5th std. are called as LPS. Another observation is that the baby sittings, LKG and UKGs are almost all run by the private institutions. Whereas the LPS and HPS are run by the Karnataka Government as well as the Private Institutions. Further it is observed that almost all private institutions run LPS and HPS jointly but the Government runs both schools together as well as separately as per the requirement.

The present status of primary schools in Davangere District can be known with the help of Table 1.

Table 1: Present Status of Primary Schools in Davangere District

SINo	TALUKs	GOVERNMENT		PRIVATE				TOTAL
				AIDED		UNAIDED		
		L.P.S	H.P.S	L.P.S	H.P.S	L.P.S	H.P.S	
1	DAVANGERE	127	162	6	65	101	79	540
2	HARIHAR	73	71	1	12	25	28	210
3	HARAPANAHALLI	134	133	1	11	23	9	311
4	JAGALUR	107	79	—	20	8	8	222
5	CHANNAGIRI	139	143	—	7	28	23	340
6	HONNALI	106	101	—	2	17	20	246
	TOTAL	**686**	**689**	**8**	**117**	**202**	**167**	**1869**

It is clear from the table that there are 1869 primary schools in Davanagere District. Further it is found that the total Government primary schools including LPS (686) and HPS (689) are 1,375, the aided private institutions (LPS-08 & HPS 117) are 125 and unaided institutions (LPS-202 & HPS-167) are 369.

4.2 COLLECTION DEVELOPMENT IN P. S. LIBRARIES

In LPS children start to learn basics of language and other subjects. In HPS they start to read the books to understand the subjects taught in the school. So each and every Government and Private Primary School develops the collection of books and other useful sources of information. The data regarding collection development of books in PS libraries is presented in the Table 2.

Table 2: Collection Development in P.S. Libraries

SINo	Number of Books in Primary Schools	GOVERNMENT		PRIVATE			
				AIDED		UNAIDED	
		L P S	H P S	L PS	H P S	L P S	H P S
1	Up to1000	23 (92%)	09 (36%)	—	12(80%)	—	12 (48%)
2	1000-2000	—	08 (32%)	—	—	—	05 (22%)
3	2000-3000	—	04(16%)	—	—	—	06(26%)
4	3000-4000	—	03(12%)	—	—	—	01(4%)
5	4000-5000	—	—	—	—	—	01(4%)
6	Above 5000	—	01 (4%)	—	—	—	—
7	No Answer	02(8%)	—	—	03(20%)	—	—

It is clear from the table that the majority of Government LPS (92%), HPS (36%) and Private aided (90%), unaided (48%) HPS are having collection between 0 to 1000 books. It is appreciable to note that 4% of GHPS have more than 5000 books.

4.3 STATUS OF PRIMARY SCHOOL LIBRARIES

An effort is made to find out the present status of primary school libraries. In view of this, collected data is presented in Table 3.

Table 3: Present Status of Primary School Libraries

Sl.No.	PARTICULARS	GOVERNMENT PRIMARY SCHOOLS		PRIVATE PRIMARY SCHOOLS	
		YES	NO	YES	NO
1	Book Collection	50(100%)	—	40 (100%)	—
2	ICT based Collection	—	50(100%)	—	40 (100%)
3	Separate Room for Library	01(2%)	49(98%)	—	40(100%)
4	Library Management				
	a. Separate teacher	—	100%	—	100%
	b.One of class teacher	100%	—	100%	—
5	Books Arrangement				
	a. Serial Number wise	100%	—	100%	—
	b.Subject wise	—	—	—	—
	c.Classified Order	—	—	—	—
6	Services Rendered				
	a. Book Issue	100%	—	100%	—
	b.Reference	—	—	—	—

It is found from the table that 100% of Government and private primary schools have collected books but no primary school has ICT based collection. One of the unhealthy conditions observed is that 98% of Government and 100% of Private PSs have no separate room for library or reading. Further it is found that no primary school has qualified separate teacher to look over the collection of books, instead, one of the class teachers has the charge to take care of the school books. The teacher in charge of books has no proper knowledge about classification, cataloguing and arrangement of books. In almost all primary schools, the teachers in charge have arranged in accordance with serial number of books. The teachers have also no idea about the library services and therefore they only issue the books to the children for the period of a week or two weeks and they allow for interchanging the books among themselves. Thus this specifies that the primary schools have only collection of books but no library facility at all.

4.4 PROBLEMS IN P. S. LIBRARIES

An effort is made to find the major problems faced by the teachers in charge in maintaining the books of the school. The data presented in Table 4.

Table 4 : Problems of Primary School Libraries

SINo	PROBLEMS	GOVERNMENT		PRIVATE AIDED		PRIVATE UNAIDED	
		L P S	H P S	L P S	H P S	LPS	H P S
1	No independent Room	25 (100%)	25 (100%)	—	15 (100%)	—	25 (100%)
2	Lack of Almerah for arrangement of Books	25 (100%)	25 (100%)	—	15 (100%)	—	18 (72%)
3	No time to teacher in- charge to render service	25 (100%)	25 (100%)	—	15 (100%)	—	25 (100%)
4	Lack of Proper training to the teacher in charge	25 (100%)	25 (100%)	—	15 (100%)	—	25 (100%)
5	Lack of Reading Interest in children	22 (88%)	20 (80%)	—	15 (100%)	—	25 (100%)
6	Penalty for missing books		25 (100%)	25 (100%)	—	—	——
7	Others.						
	a. Finance problem	100%	100%	——	——	——	100%
	b. No Power to procure books to teacher	100%	100%	——	——	——	100%

It is clear from the table that the following are the major problems faced by the teachers in managing the library. They are:

1. No independent Room
2. Lack of almarah to arrange the books
3. No time for the teacher in charge to render service
4. Lack of Proper training to teacher in charge
5. Lack of Reading Interest in children
6. Imposing penalty for missing books
7. Lack of Finance
8. No Power to Procure books.

The above major problems are expressed by almost all (100%) teachers who are in charge of books in the primary school libraries. So it is needed to re-engineer all the libraries in every primary school to achieve the goal of providing quality education.

4.5 SUGGESTIONS TO RE-ENGINEER THE P. S. LIBRARIES

The teachers in charge of books in primary school libraries are asked to give suggestions to strengthen the primary school libraries. The given suggestions of teachers are presented in Table 5.

Table 5 : Suggestions to Re-Engineer the Primary School Libraries

SINo	*SUGGESTIONS*	*GOVT. PS TEACHER*	*PRIVATE PSTEACHER*
01	Full time teacher for library is needed	100%	100%
02	Provision of at least one hour time for reading	100%	100%
03	Independent Room for library	100%	100%
04	Sufficient funds to procure good books	95%	100%
05	Delegation of Power to purchase books	82%	100%
06	Others		
	a. Teacher in charge should cancel	70%	58%
	b. Library & Information Science should include in P.S Syllabus	74%	86%
	c. Facilities to build library culture and Reading habit in children needed	84%	92%

It is clear from the table that the teachers in charge of Primary School Libraries give valuable suggestions. If one wants to render good library services to primary school children must follow the suggestions.

5. MAJOR FINDINGS OF THE STUDY

The major findings of the study are as follows:

1. The total primary schools in the Davanagere District are 1869. Out of which Government runs 1375 schools and private institutions run 494 (aided-125) schools.
2. The majority of Government and Private primary schools have up to 1000 books in collection and it is appreciable to note that 4% of Government HPS have more than 5000 books.
3. No primary school has ICT based sources in collection. Instead only books collection is found.
4. 99% of schools have no separate rooms for library and no single school has separate teacher for library. Instead one of the class teachers takes care of books of the school.
5. The teachers in charge of books have no proper knowledge of classification, cataloguing and arrangement of books. Hence every teacher (100%) arranges the books in accordance with the serial number of books.
6. No teacher has knowledge of library services to render the children.
7. It is identified that there are eight major problems faced by a teacher. Out of them the imposing of penalty for missing books is the main issue in Government primary school teacher.
8. The teacher in charge of books gives more valuable suggestions. Out of which appointment of full time teacher, providing independent room for library, inclusion of library & information science in the primary school syllabus are the urgent need to implement.

6. CONCLUSION

The primary schools play the vital role in shaping the childrens' career. As the children are the salt of the nation, they should be provided with qualitative education at primary level. In providing the quality education the libraries play a significant role. So G.L Trehan and many educationists suggest to implement Library Centered System of education. As is the Library at primary level, so is the quality of education. Hence it is utmost needed to provide good, conducive library atmosphere at grass root

level i.e primary level. Libraries at primary schools are needed to develop like children's libraries. Each library should be in charge by a separate teacher who has the qualification of two years Diploma in library science of technical board after PUC or a person who has B.A degree in library science. At the same time the inclusion of library & information science in primary school syllabus is also needed. Then only it is possible to inculcate the library centered system of education which plays a significant role in providing qualitative education to the children.

Training and Development in the IT Service Industry at Bangalore Region: A Study

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Abstract: Present study deals with training and development strategies in IT service industry in Bangalore region. The training and development activities strengthen capabilities of IT service companies and help them to achieve excellence. Present study evaluated the heart of this knowledge industry, which centered on knowledge workers. Present study briefly elaborated the training and development practices of two top-ranked companies in Bangalore. This study also pointed out that companies placed in higher value-chain have long-term vision as compared to ones in lower in value-chain.

Key words, IT industry, Business process outsourcing, Training, Bangalore region and software.

1. INTRODUCTION

In *The Third Wave*, Alvin Toffler [1] divided history into three major eras, or waves. The first wave, from 8000 BC to 1750 AD was termed the agricultural revolution, and was based on farming as the world's primary occupation. In the second wave, from 1750 to 1955, the rise of industrial civilization and the industrial revolution, manufacturing became the main occupation and the developed world was engaged in or moving toward mass production. The third wave, which began in the mid-1950s, is sometimes referred to as the information age or the information revolution and is based on the delivery of services.

Though first two waves came in India very lately, the third wave has already knocked the doors. But it is very limited to a few privileged states in India, particularly centered on metro cities, which have basic infrastructure to host the knowledge-based industries. Now, India is in transition to replicate the success stories of knowledge-based industries in every corners of the country. Government of India provides supports to state governments to establish knowledge-based industries in each state by promoting software technology parks, biotechnology parks, export-processing zones, and so on, beyond the metro cities. The IT industry in India is growing faster than other knowledge-based industries and manufacturing industries. On the other hand, the IT-enabled services (ITES) industry, which includes business process outsourcing (BPO) sector that deals with customer care, customer services, telemarketing, medical and legal transcriptions, back-office financial services, e-learning, etc., is growing much faster than other industry segments. But in terms of value-additions, IT industry is much superior than ITES industry. But ITES industry requires a huge pool of English-speaking manpower, which India has a plenty. IT industry also makes it possible of reverse brain drain. Earlier, a large number of graduates of India's top institutions used to choose jobs in developed countries resulting in wastage of government expenditure in such institutions. Now a day, a considerable number of graduates of such institutions get absorbed in companies based in India due to coming of the third wave in India.

Employment generation is another key strategic issue in India that also can be efficiently addressed through establishment of service industries. India is a hot destination for IT-based industries not only for cost savings, but also for talented human resources and their leadership capabilities. Indian IT

companies undertake human resources development programmes through various training initiatives for knowledge and skills acquisition to their human resources. Most IT service companies have addressed strategic issues in human resources development more progressively to sustain in competitive global markets and also to retain their valuable talents for future growth. This industry adopts frequently changing IT environment that requires new sets of skills and business intelligence.

Thus, training and development in this industry is particularly very important. The IT companies in India spend a good amount of financial resources to keep their manpower update and to equip with latest skill sets and business knowledge. Sometimes this amounts to a percent of their revenue earnings. The top twenty Indian IT service companies spend about 5% of their revenues earnings on average [2]. The impact of third wave would be much greater than the other two waves. The knowledge-based economy is already established in some developed countries, which is not far away from India. According to a statement by India's minister of Communications and Information Technology Dayanidhi Maran in December 2004, "It is expected that IT software and service exports will account for 30% of all foreign exchange inflows in 2008 from the figure of 8% currently" [3]. It is also expected that the share of Gross Domestic Products (GDP) from service industries will exceed the manufacturing industries within next few decades.

2. OBJECTIVES OF THE OF THE STUDY

- To identify the top ten IT industry in Bangalore Region.
- To identify the Levels of Priority in Sponsorship in Continuing Education.
- To identify thrust areas to train the professionals technical and non technical.
- To identify the reasons for conducting training for IT professionals
- To assess the kinds of training activities on 5 Points Scale.
- To know the training delivery methods and to assess the effects of such programmes in organizational development as well as the skills development of the IT professional
- To know the project based development
- To know the Onsite and Offshore Development in a Project

3. RESEARCH METHODOLOGY

The present study will be carried out in a number of IT service companies based at Bangalore, which have corporate clients in India or abroad. The Survey approach will be used in this study to gather contemporary data. We know, survey approach is systematically gathering information, from a sample of respondents for the purpose of understanding and predicting some aspect of behaviour of the population of interest. Here, management practices with special respect to Training and Development function of different IT service companies at Bangalore region will be evaluated using survey approach. Data gathering technique: Questionnaire method to be selected as data gathering technique.

A structured questionnaire will be prepared covering all relevant information on the programmes, policies and strategic issues. The same will be circulated to the HR managers/ executives of the concerned companies. If required, some interviews of the HR managers of various companies can also be taken to get depth insight into the training and development programmes and policies of the companies. Selection of the sample selected based on top ten IT industry for the year 2006 and 2007.

Table 1: Top ten IT Industry and its production

Rank	*Name of the IT Industry*	*Sales (in Rs mill)*
1	TCS LIMITED	97,272
2	WIPRO LIMITED	82,330
3	INFOSYS TECHNOLOGIES LIMITED	71,297
4	SATYAM COMPUTER SERVICES LIMITED	35,209
5	I-FLEX SOLUTIONS LIMITED	11,386
6	TATA INFOTECH LIMITED	9,743
7	CMC LIMITED	8,074
8	MPHASIS BFL LIMITED	7,657
9	MASTEK LIMITED	5,670
10	NIIT LIMITED	3,984

TCS is the largest software services company in Asia, ahead of other Indian software service providers like Infosys and Wipro. Earlier, it became the first Indian software company to cross the coveted US$ 1 billion revenue mark. The company has a wide range of offerings and caters to industries like banking, insurance and financial services (41% of revenues), manufacturing (17%), telecom, (15%) and retail (7%). TCS was one of the pioneers of the much-acclaimed global delivery model and the same has helped it to post good results in the past and will help with future achievements as well.

Table 2: Levels of Priority in Sponsorship in Continuing Education Type of Course and Facility Offered Level of Priority

Type of Course and Facility Offered	*Level of Periority*
Sponsorship in Executive Development Programme: Less than one month duration.	5
Sponsorship in Executive Development Programme: More than one month duration	3
Sponsorship in Full-time Continuing Education Programme	1
Sponsorship in Part-time Continuing Education Programme	2
Supporting non-sponsored participation in Part-time Continuing Education Programme	4
Supporting non-sponsored participation in Distance Education Programme	5
Entitlement of leave during examination / contact classes /practical classes / project work	3
Flexible working hours during the courses	2

The above table depicts that priority of training programme conduct for their professionals, both IT professionals and domain experts. Administrative and supporting staffs also get trainings for skills development. The professionals employed in these companies usually have professional degrees, like, BE, BTech, BCA, MCA, ME, MTech, BBA, MBA, CA, MSc, etc. Additionally, a professional might haveobtained an international vendor certification to be a certified professional, like, Microsoft certified professional. This certified professional has domain expertise in particular products or tools.

3.1 Thrust Areas

The trust areas of training depends on companies specialization and expertise in IT solutions market. Companies are specialized in any business domain, like Telecom sector, Enterprise Resource Planning (ERP), Insurance sector, Banking sector, Non-Banking finance, Air Traffic control, and So on, The following types of Training are imparted to the professionals.

3.2 Technical Training

Technical Training would mean all such training, which is given to the employees to enhance their work-related skills in technical area of work. This training can be categorised mainly under the following heads

- *Systems Training* i.e., training related to software development tools, methodologies and languages viz. Java, C++, J2EE, SAP, Oracle 11i, dot Net technologies, Linux, WebLogic, data warehousing, data mining, etc.
- *Software Management Training* i.e., training related to managing software development activities viz. Project Management, System Analysis and Design, Configuration Management, Requirement Management, Estimation and Planning, Quantitative Process Management, SDLC, etc.
- *Software Quality Related Training* i.e., training related to software engineering processes viz., Quality Assurance, Process Improvement, Testing, Review Methodology, Defect Prevention Techniques, Six Sigma Approach, capability maturity models, etc.
- *Domain Training*, i.e., training to impart domain knowledge to the nondomain experts, and refresher course to the domain experts.

3.3 Non-Technical Training

Non-Technical Training would mean all such training, which is given to the employees to enhance their managerial and leadership skills as well as to boost up their work motivation and morale. These training can be categorized mainly under the following heads;

- Training programmes on *Individual skills development*, viz. Soft-skills Development, Team Building, Leadership, Time Management, Stress Management, Conflict Management, Corporate Ethics.
- Training programmes to initiate *change in organization*, like, training on Change Management and Business Process Reengineering.

Table 3: Reasons for conducting training for IT professionals

Feasible Reasons	*Level of Priority*
To develop skills in latest versions of IT tools or techniques	5
To enhance performance of the professional	5
To enhance quality and standards of products or services (TQM)	4
To develop latest IT skills	4
To reduce cost of operations	4
To promote the participant into a higher grade	3
To make the company a learning organization	3

The Table 3 depicts the reasons for conducting training programmes in the IT service companies in Bangalore Region in the order of importance and relevancy on Five points scale, where 1 denotes least level of priority and 5 denotes highest level of priority. The reasons with highest level of priority for conducting training are: to develop latest IT skills and to enhance performance of the professional, whereas the reasons with medium level of priority are: to promote the participant into a higher grade and to make the company a learning organization.

Table 4: Kinds of Training Activities on 5 Points Scale

Kinds of Training	*Level of Priority*
Induction Training	5
On-the-Job Training	5
IT Skills Development Training	5
Soft-skills Development Training	4
Managerial Skills Development Training	4
Quality Assurance/ Quality Management Training	4
Language Proficiency Development Training (English/ Foreign/Local Language)	3

The Table 4 illustrates the kinds of training activities and their level of priority. Bangalore-based companies have higher priority in induction training, on-the-job training and IT skills development training, and less priority in foreign language proficiency development training. Less interests in foreign language proficiency development probably indicates that most companies have less projects in non-English speaking countries.

Table 5: Training Delivery Methods

Training Delivery Methods	*Level of Priority*
Through Training Centre/ Division located in Bangalore	5
Through Training Centre/ Division located in Bangalore	3
Through Training Centre/ Division located abroad	2
Through External Training Providers	4
Through E-Learning Providers	1

The Table 5 shows formal training delivery methods. Most companies conduct training programmes either locally through internal trainers or through external training providers located in Bangalore. Some companies, which have India headoffices in other cities, conduct training through their national training centres or head-offices. The e-learning mode of training is presently very rare in most of the companies. Some multinational companies have training facilities abroad. They seldom send their IT professionals to impart technical training.

3.4 Project-based Training

The IT service companies in Bangalore mostly have project-based structure. In a project-based structure, a department is divided into teams and they are grouped in project areas. Thus a department might have separate teams for distinct projects, for example one for each software product being developed. The different project teams may or may not have same internal structure, but most contain analysts, programmers and testing staff, to cover the development of the system from start to finish, i.e. from feasibility study to implementation [Figure 1].

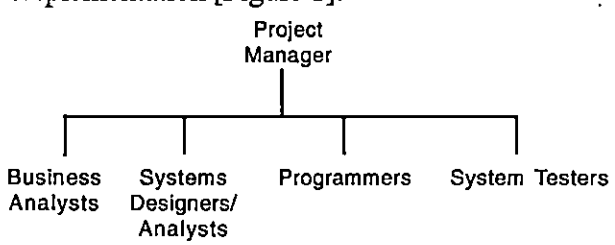


Figure 1: Project-based Structure

Sometimes, a project team is divided into two separate sub-groups. One subgroup takes care of onsite development at client sites, another subgroup takes care of offshore development at Bangalore office. Some senior team members have to look after both subgroups to coordinate and integrate the things. The Figure 4 shows how two groups are integrated and coordinated.

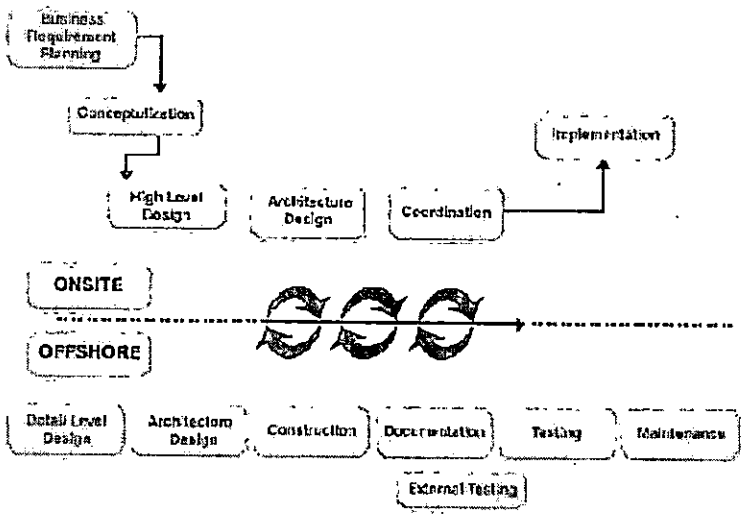


Figure 2: Onsite and Offshore Development in a Project

The implications of project-based structure for training are somewhat different. Here, the project leader is the line manager for his people. Although his primary concern is getting the project delivered on time, he also looks after the welfare of his staff including training. A project leader has greater scope for allowing his team members to learn something of the other roles within a development project. But, due to project-focused nature, a team member is allowed to learn only project-related skills. Thus career-related training needs are frequently postponed to a later date.

In this structure, each project typically has its own training budget to spend as required. The difficulty arises if one project finds it needs to organise more training than it had budgeted for (to cater for unexpected staff turnover or a new sets of software tools or any other reason), while another project needs less training than it had planned. There are some other problems in project-based training. The IT service companies in Bangalore always try to evolve certain solutions to overcome such problems.

4. CONCLUSION

Present study explores the reasons of phenomenon growth of Indian IT service industry than any other industry in India. Present study has found that IT service industry in this country is considered as a knowledge industry, where knowledge workers regularly refreshing their knowledge through training and learning. Where latest cutting edge knowledge is imparted to the professionals through training and development, more value addition is taking place. To move up the value-chain, IT service companies invest their resources in training and development for their people. The people are assets of the companies who enhance productivity of the clients by producing very competent IT solutions and also create wealth for their own companies. India is the greatest choice to the Blue Chip and Fortune 1000 companies for outsourcing their IT services and solutions. Also reputed multinational

IT companies have found India as a best place for establishing their research and product development centres. Proactive government policies, investor friendly atmosphere, and relaxed regulatory policies – all played a role for the phenomenon growth in the Indian InfoTech sector. India's success in this sector has implications for the country emerging as a significant player in tradable services more generally. It has given the country a greater measure of self confidence. Indian IT service industry has spurred competition among Indian states, keen to attract investments in this sector. Bangalore is one of hottest choice to the national and multinational IT companies as a promising IT development centre. Bangalore is also known for the entrepreneurship skills, as we come across the success stories of homegrown companies in Bangalore, which could touch the world with their much acclaimed IT solutions. The present study observes that training and development strategies of IT service companies in Bangalore are at par the Indian industry standards. The Indian IT companies as well as their multinational counterparts provide training and learning supports to their professionals not only for present requirements but also for future growth. Skills upgradation training is very common to the companies in Bangalore. Every company provides induction training to help new entrants adapt to company' unique culture and environment and to make them productive. Career development training is provided by top ranked companies to nurture their talented people and to make them future leaders. The companies already moved up in the high value-chain recognise the value of future-oriented training, but other companies only concentrate on the technical skills development for their undergoing or forthcoming development projects. Some Bangalore-based companies aspire to achieve the excellence, and train their people to realize it. Training of their professionals in cutting edge tools and techniques leads the companies to deliver high quality solutions to their international clients. The greatest strength of Bangalore based IT service companies is their people's knowledge and it is their associates and managers who deliver the outstanding projects upon which Bangalore has built its reputation. Bangalore-base companies are committed to facilitating continuous learning among their professionals. This commitment plays an important role in ensuring that the IT professionals keep themselves current with leading-edge technologies and leadership skills so that they can perform their roles effectively and efficiently.

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Up-gradation of Public Library Services with IT Applications

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1. INTRODUCTION

Information explosion; Information Technology; Internet; Electronic Publishing; E-Books; E-Journals; the present day accent instant access to information -all these have become very commonly used terms in the present day information resources scenario.

All the above changes in the information resources have created a need for librarians to reorganize their libraries to serve the present day information needs of their clientele. The need to provide fast access to latest information through variegated modern information media made it essential to have the corresponding equipment to access the information through these media, Viz. – Computer with CD-ROMs, Internet connectivity for libraries; etc.

In view of the emergence of modern information media and the development of equipment to access information through these media, it has become mandatory for libraries to plan their infrastructure a new and also brought about a need for traditional librarians to become Information Scientists.

Automation is considered as only the first step which ought to be further extended to enter the plethora of opportunities that are open for the librarians to access different sources of information through various computer oriented channels like INTERNET,ON-LINE DATABASES, E-MAIL,VIRTUAL LIBRARIES, ELECTRONIC PUBLISHING etc. Undisputedly, these have widened immensely the scope of access to information barring physical boundaries. The librarians can not continue with the same old traditional ways to provide information and it is felt indispensable for them to reorient themselves to suit the changing trends. The librarian has to play the new role of "Knowledge Navigator" with his technical knowledge and professional techniques.

2. NEW MILLENNIUM – ROLE OF LIBRARIANS

With the changing scenario around, the librarian must invariably equip him/ her self and develop greater tendency for using the latest information tools for different activities. These who are reluctant to welcome the new technological changes would lose their identity but will provide excellent opportunities to those who use it. Obviously, the librarians would play the role of "Knowledge Navigator" rather than "Custodians of libraries".

In the millennium, technological developments in the fields of computers and telecommunications would play a vital role in information exchange and resource and resource sharing through networks. The user finds him/ her self in a state of chaos and confusion amidst the vast and abundant information available to retrieve the specific information required. The Librarians comes to his/her rescue and with his/her latest technical knowledge and professional techniques navigate the user to the shores out of sea of knowledge.

3. WHAT IS AUTOMATION?

Library automation broadly can be described as mechanization of the traditional library operation by computers, to get the required information faster than the traditional ways. The library automation is a computer based system to carry out in-house operations of the library, such as acquisition, circulation classification, cataloguing, stock-taking etc.

4. NATURE

An automation in Libraries utilized in many technical and administrative services. In Automation of Library the use of computers is unavoidable, and it has its own importance in book purchasing, listing of periodicals, classification, cataloguing, abstracting and indexing and analysis of available information etc., are operated by automation.

The speed information methods are only possible by the computerization of library in present days. The information accuracy and certain speed maintenance can be possible by Automation Systems.

5. LIBRARY SECTIONS – AUTOMATION

Library sections through Automation likely to be emerged are

1. Acquisition control
2. Serial Control
3. Cataloguing, Classification and indexing
4. Circulation Control
5. Information Retrieval; and
6. Managerial applications.

Automation depends totally on computers. Computer using in libraries likely

1. For supporting clerical functions associated with technical processing and Circulation work.
2. For information storage, retrieval and dissemination; and
3. For supporting "Management Information Services" for librarians, especially in analyzing library statistics.

6. ADVANTAGES OF AUTOMATION

The 'versatility' and 'speed' of computers offers numerous benefits, Computer applications in libraries has many fold advantages.

- Routine and repetitive jobs are handled easily saving and eliminating drudgery.
- A variety of multiple outputs may be generated with a single input in automated systems. For example a database of bibliographic records can be used for, generating accession list, special purpose bibliographies, searching/querying, etc.
- Backlogs in the acquisition section/cataloguing section are fairly common. Computers can help solve this problem by improving productivity.
- It improves quality of services

- Services like Current Awareness Services (CAS) and Specific Dissemination of Information (SDI) can be given to the users very easily.
- Instantaneous answers to multiple queries.
- Decreasing costs, versatility and stupendous processing power of computers have made automation very cost effective.

7. SOCIO-ECONOMICAL BENEFITS

1. It develops.social consciousness, scientific approach among the people.
2. It helps us to learn many languages and to extract the knowledge.
3. The understanding gap among the persons will be reduced.
4. Environmental problem with regard to weather, water, and sound will be reduced.
5. Research and laboratory capacities endeavors towards growth and production.
6. Non-documentary, Audio – Visual equipments and Micro system will be developed.
7. Co-operation in various libraries with regard to resource sharing and utility will be increased.

What is a library Network?

Networks: Different Types: some phrases explained.

When a group of libraries get together and have a formal arrangement to share their resources for the benefit of all members then we have a library network. The sharing could be facilitated by a centralized catalog of the collection of all the participating libraries. The centralized catalog is rendered accessible at the user's computer terminal via telecommunication means. The sharing of resources is not merely restricted t book collections of Inter Library Loans. It could as well extend to periodical holdings, exchange of expertise and knowledge, centralized cataloging etc. Benefits are intended to be more than casual Inter Library Loans.

8. REVIEW OF EXISTING LIBRARY SOFTWARES AND NETWORKS

Among the available softwares, some of the important softwares are DELSIS,DEL-DOS, DEL-WINDOWS, all developed by Delhi Library Network (DELNET), New Delhi; SANJAY, SUCHIKA, developed by Defence Scientific Information and Documentation Centre (DESIDOC), Delhi; Granthalaya developed by Indian National Scientific Documentation Centre (INSDOC); New Delhi; LIBSYS developed by libsys Corporation, New Delhi; MAITRAYEE developed for Calcutta Libraries Network (CALIBNET) with the support of National Information System for Science and Technology (NISSAT), New Delhi; CDS/ISIS developed by UNESCO and distributed by NISSAT in India. With the Advancement of information technologies, the quality of soft wares in terms of functionality and facilities is being continuously upgraded and the libraries networking efforts have also been made seriously in this decade. In India, some of the libraries networks like INFLIBNET at Ahmedabad, DELNET at Delhi, CALIBNET at Calcutta, and some city networks like ADINET (Ahmedabad Libraries Network), BONET (Bombay Libraries Network), BELNET (Bangalore Libraries Network), MALIBNET (Madras Libraries Network),etc. have come up.

Internet is also helping libraries in various ways for their automation and resource sharing. Indian are also using Internet for searching resource available on it and providing access to their resources to others. Now soft wares with Internet Interface are being developed in India for helping Indian

libraries to get the full benefit of Internet because today the focus in library automation is on inter connecting systems, information resources and uses.

8.1 What are Networks?

The term network has been defined by several persons in various terms, but the consensus seems to be that networking is an interconnection of intelligent computers and work stations by cables for resource sharing, information exchange, security for database, etc.

8.2 Types of Networks?

Distance plays an important role in the construction of networks as the signal gets distorted with cable length. This factor classifies the networks into 3 different categories. Local Area Network (LAN); Metropolitan Area Network (MAN) and Wide Area Network (WAN)

- **LAN:** is limited to a small geographical area, a maximum of 2-Kms. Or within a building of a campus which is owned and maintained by a private organization. This uses Broadcasting transmission techniques.
- **MAN:** is basically a larger version of LAN where the area covered will be more than a single LAN, and more than one building can be interconnected. It supports both Data and Voice Transmission maintained by public or private organizations, and the type of communication is Broadcasting.
- **WAN:** covers a large Geographical area such as a country or a continent and is an network of interconnected networks. This should be maintained by a public organization and the mode of communication technique is point- to-point.

8.3 Why to Go for Networking ?

A look at the various advantages of networking will provide and answer to the question "why" of networks:

- **Resource Sharing:** Data information is available to anyone on the network irrespective of the physical location of the resource and the user.
- **Security:** Using the security resources of a networking, software can be safeguarded by installing passwords, paper user rights and file attributes. Software and data can be backed up from a single location with minimal effort.
- **Reliability:** High reliability is achieved by giving alternative sources of supply i.e. ability to continue operating in the face of hardware / software problems.
- **Distributed Data Management:** (The data can be managed at server itself). Data cab be centralized at the server instead of managing it at individual terminals, so that each user can access the relevant data to serve this purpose, thereby increasing the speed of the task.
- **Versatility:** LAN is flexible in the aspects of cost effectiveness, easy maintenance and up gradation, and provides internal communication.

In view of the above advantages, it is proposed to have a networking within Public libraries. This will enable staff and users, management & administration to access the information or data from various locations with least amount of time expended.

Skills required to fulfill the changing role of libraries:

1. Library and information handling skills

2. Service orientation
3. ICT knowledge skills
4. Communication and training skills
5. Marketing and presentation skills
6. Understanding of cultural diversity
7. Knowledge mapping skills

There should be proper co-ordination of activities between the different levels of Libraries, specially in respect of those activities which will be of common interest, e.g. training, sharing of databases and contents, problem solving, transaction analysis, gathering of information towards developing uniform standards and modeling of inspection of need, access and dissemination, and inspection of progress of knowledge based activities and identifying weaknesses in the system, if any.

The following routine jobs may be outsourced: stack management, library binding, stock verification, retro conversion, bar coding, borrowers registration, digitization, library security and upkeep, physical infrastructure and maintenance, computer network and maintenance.

9. CONCLUSION

Public libraries in India is spread all over the countries, consist of state central libraries in every state, district libraries, urban public libraries at the cities and rural public libraries at the villages. Public libraries are mainly supported by state governments and local authorities, and some times by the central government, developmental agencies, non-government organizations and private trusts. The Delhi Public Library (DPL), established in 1951 by government of India in collaboration with UNESCO, caters library and information services to the National Capital Territory of Delhi. It has 176 service points spreads over five regions and consists of branch libraries, sub-branches, community libraries resettlement colony libraries, reading rooms, mobile library points, Braille library and deposit stations. The DPL is a recipient of books published in India as per the provision in the Delivery of Books and newspapers (Public Libraries) Act, 1954. The DPL has collections about 2 million books and other documents. Raja Rammohan Roy Library Foundation (RRRLF) is the nodal agency of the Government of India to support public library services and system and promote public library movement in the country. The RRRLF undertakes different functions in each state and union territory through a State Library Planning Committee (SLPC) or State Library Committee (SLC). Its headquarters is located at Kolkata and it has four zonal offices in Kolkata, Delhi, Mumbai and Channai. RRRLF provides financial and technical assistance to public libraries and organizations engaged in the promotion of public library development through different schemes. Schemes of RRRLF broadly categorized as Matching Schemes and Non- Matching Schemes. Assistance under matching schemes is given from the resources shared on 50:50 matching basis with the state governments. Assistance under non-matching schemes does not have share of the state governments.

There is also provision of training of public librarians in the Public Libraries Act in some states, in the forms of orientation training, refresher training. The public librarians should be aware of recent development in information sources and information systems, especially in the digital environment, as many public libraries worldwide are providing web-based library and information services to their users. Digital divide in the India can reduce significantly if they use computers and Internet technologies in the public libraries at the grass-root level. The users of public libraries then access digital information

available through Internet to keep abreast of recent development in their areas of interest. Information literacy competency development programmes for public librarians and users can be a part of provisions in the Public Libraries Act of the states.

In the present millennium the information access through the Digital Libraries from the part of the E – revolution sweeping across the world. Libraries have been moving away from the idea of Libraries as a store house of information and towards the idea of libraries as places where the information is managed digitally or electronically. It is essential to have a strong networking of libraries with digitized information systems and services for enriching resources and sharing.

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Application of Johari Window Theory in Interpersonal Relationship in Library with Special Reference to User Oriented Services

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Abstract: In this article, we try to concentrate mostly on the fact about dissatisfaction that users often taste from user oriented services in a library. Especially, Interpersonal relationship is being taken as a root cause among others. Communication theories with special thrust to interpersonal communication have been detected and treated as cause to the effect on interpersonal relationship. Johari Window is used here as a tool for curing the rupture in interpersonal relationship through interpersonal communication and for searching a way out for providing effective assistance to users in locating and directing to information resources. Findings shows exchange of information between information resource provider and users depends on adequate degree of self knowledge and a substantial amount of self disclosure. These dimensions of an Individual's impact on the exchange of information have been combined in, expressed by and anatomized through 2 x 2 matrixes labeled the Johari Window.

Key words: Act(s) as function, Direct(s) to function, Disclosure, Feedback, Interpersonalism, Interpersonal communication, Interpersonal relationship, Johari Window

1. INTRODUCTION

When two parties (information resource provider and users) in a library interact, they initiate a relationship whose quality is determined by the contributions each makes and how these contributions are received by the other. An adequate degree of self knowledge and a substantial amount of self-disclosure to the other person are essential to the development and maintenance of a sound interpersonal relationship. These dimensions of an Individual's impact on the exchange of such information have been combined in and expressed by a 2 x 2 matrix labeled the Johari Window.

There exists a set of data about oneself, part of which is known to the individual, and part of which is unknown. Similarly, the other party has access to information about the individual and also may be deprived of some relevant facts. As described by the axes of the Johari Window, the interaction of these two fields of knowledge/ignorance forms the foundation for any interpersonal relationship. The overall quality of that relationship may be enhanced or inhibited, depending on the quantity, quality, and relevance of the data available, and whether the parties choose to use them or ignore them.

User oriented services in library and interpersonal relationship share a cause-effect relationship. Retrieval of pinpointed information resources or drive users to exact location of information resources solely depends on proper functioning of interpersonal communication. Any distorted interpersonal communication produces rupture in interpersonal relationship and result in an ineffective, inefficient user oriented services. Thus exercising healthy interpersonal communication is essential.

2. INTERPERSONALISM AND INTERPERSONALIZATION IN LIBRARY

Swanson (1878) as quoted by Popoola (2005) says that survival of human beings in society depends on information for problem solving, planning and decision making. These three aspects can not be fixed up without the indispensable on time help of information appropriate to the situation.

Needing information is a clear indication from a person centered on problem(s). The term 'problem' here is in generic sense and directs to such a situation where one's self knowledge base refuses to answer in a particular state or situation. It is the time when one begins to search for information to reach the destination (getting out of the state of problem). Searching directs a person to the information resources which includes human resources or non-human resources. As soon as one has got the demanded (information on payment) information/requested information, he/she puts it into action (decision making).

Although information can be collected from different resources, may it be human or non-human, there must be a human interface that actually ACT(S) AS information resources or DIRECT(S) TO information resources, because among all human mind is the utmost generator, interpreter and compiler of information. This is also reflected in Samuel Johnson's words, "*Knowledge is of two kinds, we know a subject ourselves, or we know where we can find information upon it*". When a person ACT(S) AS information resources, he/she himself/herself immediately becomes information resource and when a person DIRECT(S) user TO the information resources, he/she himself/herself immediately becomes intermediary or middleman between users and resources of information. If viewed as two distinct functions, DIRECT(S) TO acquire a more prominent place in library than ACT(S) AS.

DIRECT(S) TO function is an integral part of library and information profession, because being information resource providers we act predominantly as intermediary or middleman (either for price or priceless) between users and resources of information. DIRECT(S) TO function provides us autonomy to be communicative, interactive, interpersonalised with users and allows a continuous transfer of information in both directions. This function is activated and run as and when we(information resource providers) are going to be engaged in a situation of felt need for Information transfer or exchange which gradually takes entry into communication process and goes under various layers. So, when one undergoes the DIRECT(S) TO function, he/she also undergoes several communication processes simultaneously, which means only for the sake of DIRECT(S) TO function we have to undergo several communication processes such as; interpersonal, interactional, transactional, and two-way communication. That is why presence of DIRECT(S) TO function can be observed in several areas of a library services such as, reference service, referral service, selective dissemination of information, literature search, continuous resource sharing, community information services and like. These communications processes share many common features and are related to each other in many ways. Thus the scope of DIRECT(S) TO function is as follows:

2.1 Interactional communication

Sense of interactive ness gives rise to interactional communication. Receiver of information first receives the message from sender and gradually enters into a turn taking process. Receiver then decodes the message to ascertain some sort of meaning of that message. Now it is time for the receiver to make a reply to the generator of information. Then the receiver encodes symbols that can be placed in the form of a message and sends reply (feedback) to the generator and then generator reshape or change a return message and send another message to the receiver. Feedback plays an important role in DIRECT(S) TO function and may involve verbal and nonverbal cues. This turn taking is akin to what Galanes, Adames and Brilhart call, "...a tennis game. The server sends the message; the receiver lobs a response back. Even if there is no response from the receiver, the lack of a response is also a feedback to the originator". What does this model represent with respect to communication in a library? It is a key to create a model that best explains face-to-face human communication is to

show that the responses of the other person involved are continual. In a typical library environment, library professionals on reference desk come across such communication process everyday.

2.2 Berlo's manifestations

To Berlo, communication is a dynamic, interactive process. Berlo has encountered the linear, step-by-step information approach with the following ideas:

"If we accept the concept of process, we view events and relationships as dynamic, ongoing, ever-changing, and continuous. When we label something as a process, we also mean that it does not have a beginning, an end, or a fixed sequence of events. It is not static, at rest. It is moving. The ingredients within a process interact; each affects all the others."

2.3 Transactional communication

Berlo's dynamic process has been extended and reshaped by various contemporary theory and research. Theorists view communication as a transaction process. The prefix 'trans', means mutually reciprocal, is stressed instead of 'inter', means between. This theory states that, "all persons are engaged in sending (encoding) and receiving (decoding) messages simultaneously. Each person is constantly sharing the encoding and decoding process and each person is affecting the other" - (john r wenburg and William w wilmount, the personal communication process, new york: john willey, 1973, p.5). There is a continuous process of feedback as well as disclosure in the communication process.

This process is based on social approach of organizational behavior. The reciprocal determinism of social learning is very similar to transactional approach of communication. Transaction of messages between between information resource provider and users is mutually reciprocal through feedback / disclosure mechanism.

2.4 Two way communication

Two way communications is possible by feedback and has a back and forth pattern. Here sender sends the message and the receiver's response comes back to sender. The result is a developing play-by-play situation in which the sender can adjust the next message to fit the previous response of the receiver. Transactional and two way communication are two sides the same coin. Sigband on important role of feedback in this communication viewed that:

"It (feedback) permits expressive action on the part of one and/or more persons and the conscious and unconscious perception of such action. Perhaps one of the most important factors in this network is feedback which is vital if the originator and receiver want to secure some level of effectiveness in the communication process."- (Norman b sigband, communication for management, Glenview, iii.: scott, foresman, 1969, p.8)

2.5 Interpersonal communication

Interpersonal communication concentrates upon two-person communication and takes into account other variables, such as relationship of the individuals involved, their degree of interaction , knowledge level, expectations in respect of each other and allied measures. All the upper mentioned three processes (Interactional, Transactional and Two way communication) establish some similarities with interpersonal communication as all these should be happened between two or more persons, but the core thing is that how individuals tend to influence each other through communication with a view to mutually regulates and controls each other's behavior pattern.

What steers interpersonal communication most is intrapersonal communication. Intrapersonal communication concentrates upon individual behaviour and its various aspects such as: observing,

problem solving, thinking, speaking and allied activities with special reference to input, analysis and processing of information that take place within individual self.

Interpersonalization is thus a process, mostly focused while getting acquainted with users at the initial stage communication which gradually proceeds through feedback mechanism. And interpersonalism is the philosophy which works at the back-end of the process of interpersonalization.

Now we may say that, interpersonal, interactional, transactional and two way communication, these four phenomena exist in a client-oriented service, generally provided in a library. Thus communication in a library is a 'transactional - two-way - interactive - interpersonal communication' and interpersonalism is the concept or thought that envelops all these four.

DIRECT(S) TO be the function for those librarians and information resource providers who are directly assigned to user oriented services and maintain a trusted and delicate zone of interpersonal relationship by their optimum satisfactory services.

So, the need for an interpersonal communication is realized only for effective application of DIRECT(S) TO function. In other words, to nourish and flourish the DIRECT(S) TO function one has to follow the path of interpersonal communication and in return, one shall be capable of establish himself/herself as an effective information resource provider as well as maintain a trusted relationship with the users.

The process of interpersonalization is predominant in face-to-face user service in the library domain but it is always overlooked. Pure care should be taken in this respect since it is fruitful endeavor.

Like any other business organization, under library's roof there goes several client services. Client services such as reference service, selective dissemination of information, literature search (retrospective or current), information retrieval and so on. These are such areas where library professional everyday get interacted with users and involved in a transactional communication process in order to meet their needs for a better information service.

Knowing user's need and retrieve exact information is one of the most crucial jobs which need a quick but temporary attachment (relationship) with users which should be developed from initial interaction (communication) between users and library professionals. We should develop an enduring relationship at minimum time so that we can serve them in future at ease.

3. NURTURING INTERPERSONAL COMMUNICATION IN A LIBRARY

What we have seen that, DIRECT(S) TO function and interpersonal communication go hand in hand in a library. They are interrelated. Strictly saying, without an excellent interpersonal communication DIRECT(S) TO function can't survive alone. If there is a breakage in interpersonal communication, DIRECT(S) TO function would surely get affected and ends in a stop.

One of the major steps towards this problem is quickly built enduring interpersonal relationship through interpersonal communication. With the advent of the term 'information explosion', people need resources of information through a more caring service. They feel pleased when they get effective and speedy service in an 'I know him/her' (user friendly) environment. It is quite natural that an unknown person in an unknown place feels more troubled than a known person in a known place. So, information resource providers must know users not only by their needs and demands but also by their behaviour, conduct, manners, thought, knowledge base, level of information requirement, self awareness, and above all, how far they know us, our library and information resources. These should

be done because, our ultimate motto is, to DIRECT users TO the right location of information as well as information resources.

So, interpersonal relationship is a key aspect in smooth steering of interpersonal communication and free flow of feedback/disclosure.

4. THE JOHARI THEORY

The Johari Window, named after the first names of its inventors Joseph Luft and Harry Ingham, is one of the most useful model describes the process of human interaction. A four paned "window," as illustrated below, divides personal awareness into four different ways as represented by its four quadrants: Open, Hidden, Blind, and Unknown. Lines dividing the four panes are like window shades which can move along with a progressing interaction.

In other words, Johari window is a model of communication and interaction, a simple and useful tool for understanding and training self awareness, improving communications and interpersonal relationships. It is often called as a 'disclosure / feedback model of self awareness', or an 'information processing tool'. It is a tool for better understanding of interpersonal communication and relationship. It can primarily be used in a library setting as a heuristic exercise.

Four johari windows from librarians' view point in their conduct with users can be described as follows:

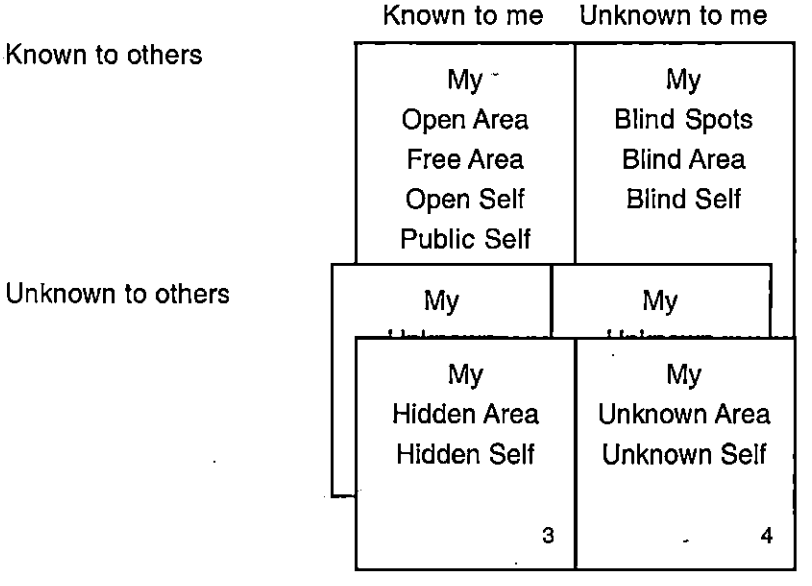


Fig.1 Simple Johari Window

Upper figure is a blank window which comprises of distinctly four equal panes. These four panes can be termed, simultaneously as 'Region', 'Area', or 'quadrant'. Four panes, in light of library and information professional, act as follows:

Pane 1: This region is called Open area, Open self, Free area, Free self and generally the Arena. The "open" quadrant represents facts that both I know about myself, and that you know about me. For example, I know my name, and so do you, and if you have explored some of my website, you know some of my interests. The knowledge that the window represents, can include not only factual information, but my feelings, motives, behaviors, wants, needs and desires... indeed, any information describing who I am.

When I first meet a new person, the size of the opening of this first quadrant is not very large, since there has been little time to exchange information. As the process of getting to know one another continues, the window shades move down or to the right, placing more information into the open window.

In view of library and information professionals, we should analyze this pane as what/whether we know/aware about/of the library where we work as well as whether we are conscious/aware about/ of our behavioral attributes we concerned about when going to serve users or interacting with them or vice-versa. Being information resource provider, the open area should be guided delicately and wisely if our self image must be applied positively. It helps us to show our skills and exercises. More information we put into this pane more will be the space of this pane. So, the information it bears or represents, should describe 'what the library has', 'what the library can provide', 'what the library possesses' and like, known to both information resource provider and users. While interacting, communicating interpersonally with users, library and information professionals should possess positive or near-to-positive answers, up to their utmost level. Answers might be in the following ways:

a) Yes, I can provide you

b) Yes, we have

c) You can collect the information from...

d) Certainly, I can help you

e) Please wait for a minute

f) I want few days for delivering information to you

These could be some helpful tools by which we can increase the space of the pane1. Library and information processionals, please remember, it can be done only when we are fully aware and conscious about our personal traits, knowledge base and the information services (within the library periphery or out of it) we are providing because, it is the pane of open self where users know about me and my library and so they are coming to hear 'Yes' not the 'No'.

Pane 2: The "blind" quadrant represents things that I don't know or am unaware about/of myself but you know about me. So, for example, I may have unknowingly gotten some marks on my shirt. This information is in my blind quadrant because you can see it, but I cannot. If you now tell me that I have something on my shirt, then the window shade moves to the right, enlarging the open quadrant's area.

So, this area represents, in view of library and information services field, what others know about us but to/of which we are blind or unaware. It includes what others think of us and of our library's services, the attitudes and qualities, services, availabilities they can access in the library while we all have blind spots.

It is evident in our library and information services also, like sometimes users go to newly recruited information professional that is unfamiliar with his new office and return with some unfamiliar answer. Users know or aware about/of the library or information center's services and availabilities better than the new information professional. So information professional has his information in his blind spot. At that time, if users and colleagues tell him, make him aware or reveal the fact to him then, the window shade moves to the right, enlarging the open quadrant's area. This process is called feedback solicitation. Now, he may also have blind spots with respect to many other much more complex things. Then the problem is how he (information professional) can get the information out in the open, since it may be affecting the level of trust that is developing between the information professional and the

user community. He can reduce the area of blind spots and enlarge the area of open space by means of openness of mind, trust, inquisitiveness, liberal view and like.

When this part of the window is too prominent, it may represent an information server or information resource server who is not at all a good listener, good knowledge acquirer, information gatherer. Information resource servers must accept constructive criticisms, overviews, comments, statements, etc from observers, colleagues, users. They should not be blind to the ways that the others see library services, products and procedures.

Pane 3: The "hidden" quadrant represents things that I know about myself that you do not know. This quadrant is also called 'hidden area', 'hidden self', 'avoided area', 'avoided self' and generally as 'façade'.

This hidden or avoided self represents information that a person knows about himself, but which is kept hidden from others. It's natural for very private information and feelings to remain hidden. Indeed, certain information, feelings have no bearing on work and should remain hidden. However, typically, a lot of hidden information is not very private, it is work or performance related, and so is better positioned in the open area. By telling others about the hidden information (information is hidden without any justified cause) about ourselves we should reduce the hidden area, and increase the open area which enables better understanding, cooperation, trust, and productivity. Reducing hidden areas also reduces the potential for confusion, misunderstanding, poor communication, etc, which all distract interpersonal relationship.

So for example, I have not told you nor mentioned what is my favorite color. This information is in my "hidden" quadrant. As soon as I tell you that I love "red", I am effectively pulling the window shade down, moving the information in my hidden quadrant and enlarging the open quadrant's area. Again, there are vast amounts of information, virtually my whole life's story which has yet to be revealed to you. As we get to know and trust each other, I will then feel more comfortable disclosing more intimate details about myself. This process is called: "Self-disclosure."

We often see in libraries, which hold government reports, documents, etc. unwilling to share, lend or give access to those information resources for some confidential security reason and purposes. They are only to serve the concerned government offices. It is also evident in a general library that information resource provider knows very well what the library has, then also becomes unwilling to make some information resources or information available to users. Because they think they will generate an extra burden of job by making accessible these information resources to users (McGregor's Theory of X and Y). So, in both the cases, information remains in librarians' or information resource providers' hidden self. Causes are different. In the former case, it is the government regulations and in the later, it is workers' most common unwillingness to work. There prevail so many such causes which forbid users from the accessibility of those information resources.

So, the hidden area, from library's point of view includes information resources as well as information that not to be accessed by users for whatever reason, etc. It may include some statistical data on housekeeping operations, budget or like, which we want which not to be revealed.

Pane 4: The "unknown" quadrant represents things that neither I know about myself nor you know about me. It is also known as 'unknown area', or 'unknown self'. Information, feelings, latent abilities, aptitudes, experiences etc, that are unknown to the person him/herself and unknown to others can be prompted through self-discovery or observation by others, or through collective or mutual discovery. Counseling can also uncover unknown issues.

In library and information services, it happens like, neither do we know about my library nor do users know. Let one is searching for information on 'web 3.0' and want to gain some light on this new born phenomena. Certainly, the information resource provider is also unaware of the phenomena but, he/she has to provide a little bit of information on it so as to help him/her in further excavation on this topic. This is what each and every information resource provider should do keeping in mind their basic professional ethics. Information, in this situation, is in the information resource provider's unknown area. He/she might seek for various sources and resources even user itself can help him/her in his/her effort. At last, if he/she is unable to satisfy the user then unknown self remains the same. But, if information resource provider finds any information on this phenomenon then he/she feeds his/her own unknown area or unknown self as well as provides information to the user and thus enlarges the area of open self pane.

5. FEEDBACK/DISCLOSURE

The process of giving feedback (disclosure) and receiving feedback is one of the most important activities. It is through feedback that we implement the poet's words, "to see ourselves as others see us." It is also through feedback that other people know how we see them.

Feedback is a verbal or nonverbal communication to a person providing him/her with information as to how their behavior is affecting you or the state of you're here-and-now feelings and perceptions (giving feedback or self-disclosure). Feedback is also a reaction by others, usually in terms of their feelings and perceptions, as to how your behavior is affecting them (receiving feedback).

In libraries, like most organizational institutions, users interact with librarian or information resource provider. When they interact, they need to communicate to one another their demands, needs, availability, supply, dissemination of information, etc. powered by psycho-social behaviors. When such things are communicated to information resource provider in relation with his or her own conduct, style, how he is going on, etc. it is called feedback. In general sense, it is the communication of perceptions by users to another information resource provider about the latter's conduct or response or style. Feedback is a both-way process that should be fed by both of the participants. But when it is from user's side it is feedback and when it is from information resource provider's side it is disclosure.

The process of giving and receiving feedback can be illustrated through the Johari Window.

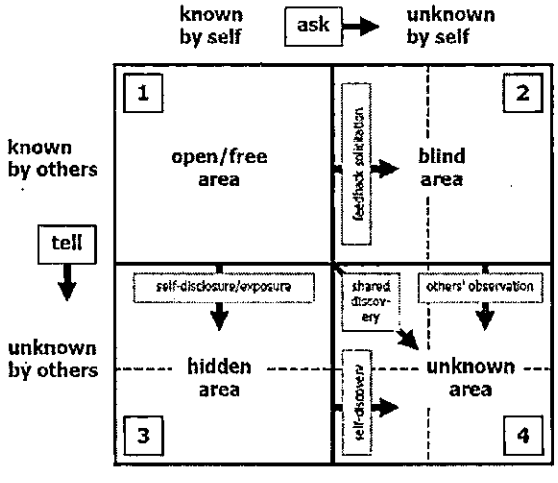


Fig. 2. Increase/decrease of quadrants through feedback/disclosure

The model can be looked upon as a communication window through which an information resource provider give and receive information about yourself and others.

There are two key ideas behind the tool:

a) That individuals can build trust between themselves by disclosing information about themselves; and

b) That they can learn about themselves and come to terms with personal issues with the help of feedback from others.

The goal of soliciting feedback and self-disclosure or giving feedback is to move information from Blind Spot and Façade to Arena, where it is available to everyone. In addition, through the process of giving and receiving feedback, new information can move from Unknown to Arena. Movement of information from the Unknown to Arena can be called "insight" or "inspiration."

6. HOW IT WORKS ON INFORMATION RESOURCE PROVIDERS

Being an information resource provider, how I can reduce my Blind Spot. i.e., moves the vertical line to the right. Since this area contains information that the users know about library but of which I am unaware. It can be described by the following figure:

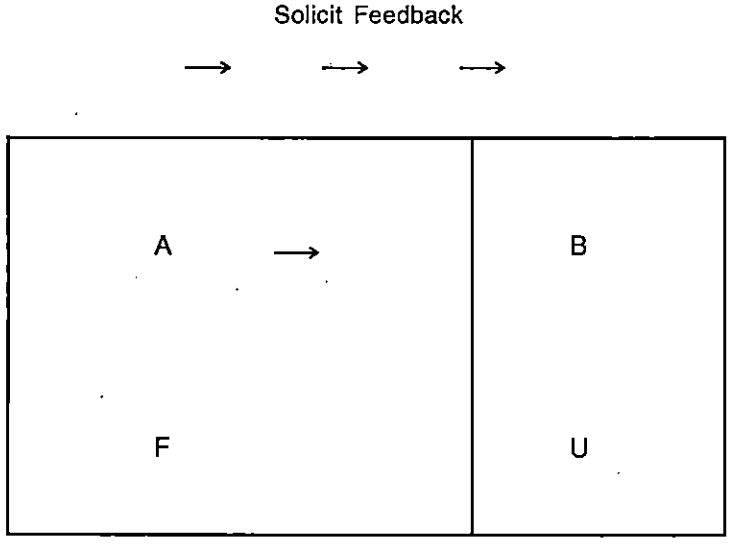


Fig. 3. Solicit feedback

The only way I can increase my information level/awareness is to get feedback from the users as well as colleagues. As a consequence, I need to develop a receptive attitude to encourage user and colleagues to give me feedback. That is, I need to solicit feedback from users as well as colleagues in such a way that they will feel comfortable in giving it to me. The more I do this; more the vertical line moves to the right and enlarge open area.

Once again, how I can reduce my Façade. i.e., moves the horizontal line down. Since this area contains information that I have been keeping from the users, I can reduce my Façade by disclosing facts about library to the users concerning my reactions to what is within the library. It can be described as follows:

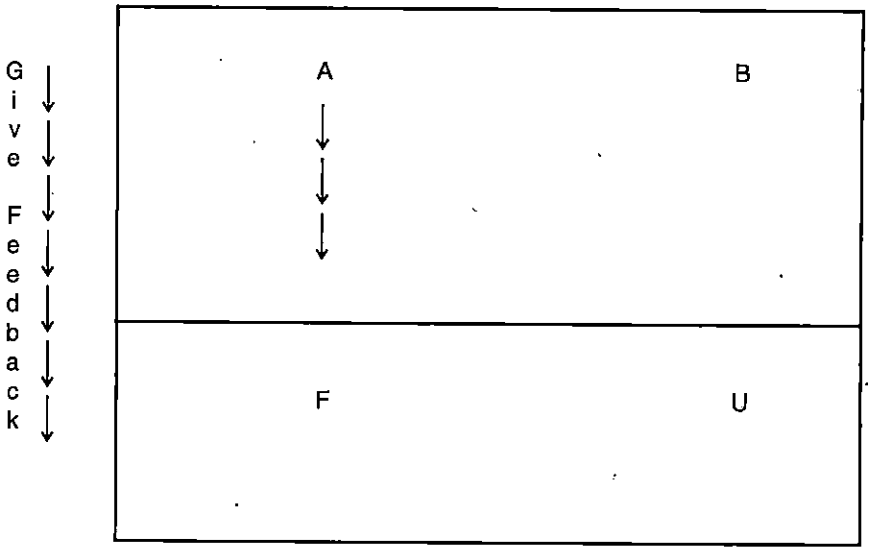


Fig. 4. Disclosure

In this instance, I am giving feedback or disclosing facts on library in terms of my perceptions and knowledge. Through this process users would come to know where the library stands. The more facts I disclose, more down I push the horizontal line and enlarge-open area.

It is noticeable that while we are reducing our Blind Spots and Facades through the process of soliciting and giving feedback, we are, at the same time, increasing the size of our Arena or Public area.

In the process of giving and asking for feedback some people tend to do much more of one than the other, thereby creating an imbalance of these two behaviors. This imbalance may have consequences in terms of the information resource provider's effectiveness in users' reactions.

The size and shape of the Arena, therefore, is the disclosure and feedback. By the help of extreme ratios in terms of soliciting and giving feedback in a typical library environment, movement of windows can be described by the following four different shapes:

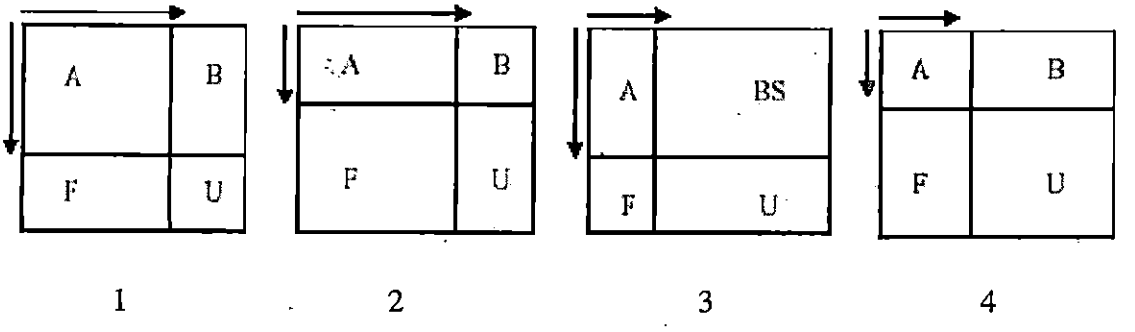


Fig. 5. Different phases of Arena

Number one is an "Ideal Window". The size of the Arena increases as the level of trust, conduct, understand, feelings with the users increases, and the norms that have been developed for giving and receiving feedback facilitate this kind of exchange. The large Arena suggests that much of the information resource provider's service is aboveboard and open to users. As a consequence, there is less tendency for users to interpret (or misinterpret) or project more personal meanings into the information resource provider's response.

The large Façade in window number two referred to that information resource provider whose characteristic participation style is to ask questions, ask for feedback but not to give information or feedback or disclosure. Thus the size of the Façade is inversely related to the amount of information or feedback flowing out from the individual. You can notice that his "soliciting feedback" arrow is long, whereas his "giving feedback" arrow is short. Since this person does not commit himself to the users, it is hard to know where he stands on issues. This stage may eventually evoke reactions of irritation, distrust, and withholding in information resource provider.

Window number three has a large Blind Spot. The librarian maintains his level of interaction primarily by giving feedback (disclosure) but soliciting very little. His participation style is to tell what he thinks of information and information resources. He either appears to be less responsive to the feedback given to him or does not hear what users tell him or ask him. He may either be a poor listener or he may respond to feedback in such a way that users are reluctant to continue to give him feedback, e.g., gets angry, cries, and threatens to leave, etc. He does not appear to utilize the corrective function (reality) of feedback. The result of his one-way communication (from him to users) is that he persists in behaving ineffectively. Thus his "soliciting feedback" arrow is very short while his "giving feedback" arrow is long.

The last window has the large Unknown area represents that information resource provider who neither knows much about himself, his library, resource holdings, etc. nor do the users know much about these things. He neither gives nor asks for feedback. As you can see in window number four, the "soliciting" and "giving feedback" arrows are very short. It takes a considerable amount of energy to maintain an Arena. He is the mystery man because it is difficult for users to know where the information provider stands or how far the library can help them. Possibility of conflict between information resource provider and users always scores the highest mark.

7. CAUTION

A secure role is important for individuals. A weak self image weakens information resource provider's confidence within himself/herself and in their work and in turn weakens people's confidence in their ability to serve them. Information resource providers must bear in mind their public relation role in order to help users.

It is not an easy task to give or receive feedback in such a way that it can be received without threat to other person. This technique requires practice in developing sensitivity to other people's needs and being able to put oneself in other people's shoes.

Getting involved in 'DIRECT(S) TO' function for information providing, in area such as library, is not easy as it looks like. If one thinks of providing pin-pointed information to users then he/she has to undergo so many complex processes of communication which are centered on psycho-social analysis of user's information seeking behaviour. Johari Window could be a possible solution to the well organized 'DIRECT(S) TO' function for information providing as it takes care of interpersonal communication.

8. CONCLUSION AND FURTHER READING

Johari window can reduce stress for information resource provider and organizations by decreasing conflict. Information resource provider can be more productive and successful at what he does and

help others to be more productive and successful improving relationships and understanding and increasing stability with users.

This paper has retained the original thrust of the Johari Window model, while expanding and redirecting it to include four dimensions of critical importance to the parties (information resource provider and users) in an interpersonal relationship in a library environment. The product is a more specific focus on four dimensions of two-directional feedback and disclosure.

Using this mode it can be seen that growth of the Arenas of the two parties to a relationship can best occur under four critical conditions: 1. Increases in self-knowledge (through soliciting feedback) 2. Self-disclosure (giving feedback) 3. Observation of the users (and provision of feedback) and 4. Facilitating self disclosure by the information resource provider.

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Changing Role of Librarians in the Emerging Knowledge Society

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Abstract: Much of the literature in library and information science give the impression that the future of libraries will be focused on one of two bipolar trends – bricks or clichés. This paper presents a evolution of library to virtual library. Thus the goal must be the creation of the shared vision of the destination which includes both physical and virtual strategic goals. It also shows the role of library and librarians are changing according to the new context.

Key words: Librarianship and Internet Age, Digital Library, Role of Librarian, Internet

1. INTRODUCTION

Librarianship is generally considered to be concerned with the principle and practice of selecting, acquiring, organizing, disseminating and providing access to information in accordance with the specific needs of groups of people or an individual. As every practicing librarian knows, rapid developments in the global communication infrastructure in the last decade or so have seriously fudged, loosened and erased the boundaries of librarianship as we know it. Taking a broader perspective of the purpose of librarianship and beyond, this presentation attempts to clarify, redefine, reshape and expand the boundaries of our concerns as we move forward to more discontinuous changes. The purpose is not to offer predictions, solutions but rather to initiate and provoke reflection and discussion that must take place right now amongst us in order for our profession to meet the challenges of change.

2. DEFINITION OF LIBRARIANSHIP

Many of the key elements of librarianship identified in the informal email summery what we would expect. What is interesting but not so surprising is that there is a strong emphasis on users and less on library collections and resources. This is probably one of the major but subtle changes in librarianship in the last 20 years, there was much more focus on building and organizing library collections. Even reference works were very dependent on good cataloging and organization of library resources. Though everything we did then was also aimed at helping the users, it was more implied than obvious. Today, we seem to be more obsessed and anxious about our relationship with users, and for good reason as we shall discuss.

"Librarianship is the discipline and profession that is concerned with helping individuals obtain reliable information to increase their knowledge in all spheres of their lives from the cumulated information store of mankind".

This following definition focuses on the intermediary or bridging role of libraries: "Librarianship is a bridge between 2 entities; people and information. Librarians consider who may need this bridge, when and where a bridge is needed, how it is to be built, how it can be best utilized. We are the planner, architect, builder, and marketer of bridges" – *Samantha Ang.*

To play this role affectingly, it is implied that libraries need to have a clear understanding of information and knowledge needs of the user on one hand and the knowledge and availability of relevant information resources on the other. The definition also assigns an end purpose for our roles, i.e. to help users obtain information that will increase their knowledge in all spheres of their lives. It makes distinction between information and knowledge, as the latter is part of an individual's makeup and cannot be disassociated from it. We help people obtain useful and reliable information but it is up to the each individual to assimilate it and make knowledge their own information property. It is clear that most librarians at librarianship perform predominantly an intermediary function. The question is whether this is relevant today. Do users need or want us to help them obtain information? Are the information resources that libraries provide – the evidence base of knowledge cumulated in the past, highly desired by users anymore? Are people concerned enough about using reliable sources of information to make an effort to obtain it? There are many questions and exciting developments in library landscape today and it might not be possible to touch all of them in this paper. Instead, we would look at the 3 major facets (i.e. users, information resources and librarians' intermediary role) and discuss the change of their nature over the years.

3. LIBRARIAN IN THE CHANGING ENVIRONMENT

In addition to the professional skills mentioned, the librarian of the future must be equipped with a wide range of personal and transferable skills in order to manage the changing environment in which he or she works. The importance of transferable skills over information technology skills should be highlighted here. Management and interpersonal skills will make librarians more effective managers of networked resources and services. As Hastings says "it is more important that digital librarians possess particular personal qualities (which are innate) rather than specific technical expertise (which can be learned).

This is not to say that the way to avoid the electronic age is for library professionals to stick their heads in the sand. The information professional must change and adapt to the new electronic information environment, he or she must learn about new technologies and be aware of the strengths and weaknesses of them. Librarians should not feel threatened by computers and technical developments but should move forward with the new technology and take a pivotal role within organisations. Information professionals within libraries are playing an increasing role in dealing with information in electronic formats by creating Web pages to promote their services to external customers and choosing automated library management systems. Skills in information organisation are more necessary in this age of information explosion. Library and information professionals have a key role to play in this era. For example, librarians are well equipped to take intranet/ the internet projects through the various stages of design and maintenance as they understand their users and their organisations information needs and have the range of skills to manage knowledge effectively. The role of the librarian in this context is to help users find the information they require then provide them with the tools to assess and use the resources for their individual needs. Creth suggests that librarians achieve this by "actively seek(ing) out users in a variety of settings" and by making "full use of information and multimedia technology" by offering instruction in a variety of formats (including Web based instruction and online tutorials).

4. ELECTRONIC MEDIA MARKET

Worldwide in 2007 there were 320 million households with broadband access. Digital publishing (e-books, e-papers online research papers etc.) is evolving into a lucrative market. Market size of global digital publishing is $340 billion publishing industry. Publishers are competing with each other to take the content online. Growth of India is industry was 15% in the last financial year. Market size for digital publishing in India is Rs. 80 million. Major publishes outsource from India at an advantage of 40% cheaper than advanced countries. Out of total publications 45% are English titles. India is third largest producer after UK and USA.

5. WHY IS IT IMPORTANT FOR LIBRARIANS TO KNOW ABOUT THE INTERNET?

Libraries and librarians have all along been collecting and disseminating documents and information in whichever form and media human beings recorded them. Thus keeping with the philosophy of librarianship, librarians have accepted and absorbed the electronic resources in the libraries. Especially from 1990s when search engines like Alta Vista, Excite, Northern Light and Google made searching the web easy, librarians and reference librarians in particular are extensively using the Internet resources to disseminate information to their users. Hence the Internet is of special concern to the librarians.

6. SWOT ANALYSIS FOR LIBRARIAN IN THE INTERNET AGE:

Since the 1800s, the field of librarianship has seen the technology grow from handwriting to electronic pen, to typewriter, to word processor, and now to computer. Electronic resources and the Internet now help to make the task of obtaining reference material more accessible and much faster than ever before. Already computer databases have rendered the bulky card catalogs obsolete and new media have broadened the range of materials available for browsing. The technology changes have been affecting almost every type of library including public, school, academic and special. Very few libraries have been immune to technology. Librarianship is one of the oldest professions in the world and the times call for a new breed of librarians, those who understand and integrate technology, information and learning into a new model. However, to sustain in the field of librarianship, librarians need to equip with technical skills such as knowledge of HTML, programming languages, knowledge of hardware basics and troubleshooting, understanding of software programs, and the skill to search, display, and retrieve data effectively in a variety of information retrieval systems.

The following are strengths and weaknesses inherent in the library science profession.

6.1 Strengths

- By the nature of their profession, librarians are service oriented.
- Librarians are able to identify, evaluate and organize print as well as electronic information resources.
- Librarians understand what the user needs and are very relavent to the user information requirements than other professionals.
- Librarians are able to train users to search and retrieve information, which is a part of user education and information literacy in his profession.
- Librarians believe in the value of information sharing via networking.

- Librarians are experienced in management concepts, which are most identical to the classification, cataloguing & indexing organization, documentation, storing and making information available on networks.
- Last, but not the least, 'human touch' they can impart.

6.2 Weaknesses

- The general feeling of the librarians is that they are threatened by technological changes.
- Librarians lack same level of technical knowledge in dealing with computer hardware, software, etc. as the concerned professionals.
- Librarians are no longer acting as gatekeepers of information especially while using the Internet.
- They are breaking users' false perception that the Internet is answer to their all information needs.
- Librarians need to interact with the end users and IT professionals to understand their specific information needs and to add value to their products.

6.3 Challenges

Is the Internet a threat to librarians? Will the increasing use of the Internet lessen library value? Being the libraries offline compete with those with online? These are some of the questions that are asked by those who all of a sudden become aware of what is happening in the library and information science field. It is a fact that information is no longer print based alone. It is a fact that the Internet has become part of day-to-day life of a majority of academic, business and Government communities. It is a commonplace that information resources, library users are turning to electronic media and phenomenal storage capabilities have been built into DVD-ROMs, portable hard disks, pen drives etc. Information, in a nutshell, is not medium specify. It can be on print and electronic sources. If libraries have to stay as information providers this reality has to reflect in their content, constitution, and working. This reality also should reflect in all budgeting and funding action of the libraries. The change that is called for is best viewed as an opportunity to stay tuned to the times rather than something undesirable. Inherent improvement has taken place in the normal work of the librarian and the opportunities that opened up as a result of digitization of information could be summarized as below.

6.4 Opportunities

- There are numerous for the librarian in the Internet and Web shared environment providing information in a timely and appropriately to the users.
- Universal Accessibility of Material – Same electronic document will be viewed by multiple users simultaneously, which eliminates the waiting periods for popular documents in the library. Rare and fragile historical documents will be scanned and stored for electronic viewing by numerous users around the world for indefinite periods.
- Patron Initiated Inter-Library Services – In the cyber library links will be provided for searching electronically stored material as in the traditional method by author, title or subject. Once the appropriate material is located, users can view at a networked terminal. If the desired material is not located during the search, the user can electronically forward a request to the librarian to arrange the document on inter-library loan from another library.
- Book and Reading Lists – Reader's advisory services have not disappeared from the list of functions libraries traditionally perform. Web versions of book and reading lists are available for users.

- Online Catalogs (Web OPAC) – The catalogs of many of leading libraries these days are available in Web-based and remote logon formats for platform independent user friendly browsing.
- Local Databases – Creation and provision of access to local information by the librarians has taken new life on the Internet.
- E-Newsletters – Communicating the news of the library to its users of both physical and virtual collections takes many forms such as electronic newsletters-bulletins, etc.
- Virtual Reference Desks – Earlier, reference librarian was available in person, or on phone. Because of the Web, virtual reference librarian is available via e-mail or through a Web form for providing reference services to the users. Many find that this facility is highly useful as it replaces the rigidity of sticking to timings for person-to-person contact.
- Virtual Tours – Virtual tours have been created by the librarian to describe the physical library.
- Web Forms – Web forms increasingly allow online provision of services formerly reserved for inside the wall transaction like Inter-library loan form, book and journal requisition form, suggestion form, etc.
- Cooperative Cataloguing – Librarians use the Web to assist in cooperative catalogue of Web-based resources.

Distance Education Support, provision of access to E-Journals, coordination of Electronic Bulletin Boards, posting guides, and hosting online tutorials are some of the opportunities for librarians in the Web environment. It is an indisputable fact that knowledge is power in the modern organizations. Acquiring greater skill, wider knowledge and familiarity with the important facets of individuals work will definitely contribute to the enlargement of ones knowledge base. A knowledgeable librarian is better placed to face the changes and the uncertainties in the emerging scenario. Earlier times, library & information science courses were not very demanding and used to attract mediocre students. This situation is not the same any more. A library & information science student should possess the aptitude and ability to work with modern technologies in the field of information science. In order to serve in the modern information age, the erstwhile traditional librarians would be better placed if they change their mind-set and make efforts to become familiar, if not proficient, in the use of modern tools and technologies.

7. ROLE OF LIBRARIAN IN INTERNET AGE

Internet and World Wide Web are very powerful and bringing changes not only in librarianship but also in his daily professional activities. Ever since the creation of United States Machine Readable Cataloguing (USMARC) record in the late 1960's and the resulting proliferation of online catalogs, librarians have been spurred by technological developments to become more efficient organizers, indexers, abstractors, archivers, in addition to assuming new roles such as, intermediary, facilitator, end-user trainer/educator, web organizer & designer, researcher, interface designer, knowledge manager/ professional and sifter of information resources. While the librarian plays many roles in an organization, it is difficult to identify a role as primary one as the same changes from time-to-time depending on the organizational objectives and requirements.

7.1 Librarians as an Intermediary in Search

In an organization, though librarians began training end-users to perform their own searches, the demand for searches by information professionals have not decreased. End-users having been trained

and having performed some of their own searches became aware of the complexities of searching, the limitations of some of the resources and of the searching process especially on World Wide Web. So, a more educated user who continues to perform simple searches on his own behalf, returns to the librarian or information specialist to perform the more complex searches. The effect on librarians has been an increase in workload because the searches are more complex and the amount of time per search has increased.

Hence, there will always be a role for the search intermediary. An Intermediary is defined by Peter Ingwersen (Ingwersen, 1992) as "A person or mechanism placed physically between IR (Information Retrieval) systems and actual user with the purpose to transform interactively requests for information to query formulations that suit the retrieval components of one or several IR systems, to model and support the actual user as to his information need and underlying goals, and to provide information of potential value to that user from IR systems". Traditionally a human intermediary is a librarian or an information specialist. An IR system includes text-presentations, classification and indexing systems, and IR techniques in catalogues and databases or other information sources. However, research in this field is directed towards implementing non-human intermediary functions into online IR systems through user interfaces and system setting. In addition to more efficient and more effective searches by librarians, research has determined that a single librarian or information professional can save the equivalent amount of time of three, or four, or even five end-users. In other words librarians are three, or four, or five times more efficient and more effective than end-users are at performing their own information searching activities. This, probably, is the most important point to remember, because it is why librarians will continue to play a role in the newly emerging digital information world. So, those searches which are not straightforward will always tend to be delegated to an intermediary for querying and providing packaged answer, drawing on a range of resources like print, online bibliographic databases, Internet and Web documents. In India, the availability of infrastructure for exploiting the Web fully like high speed Internet connectivity, access to CDROM databases are in the process of catching up with the advanced countries like USA. However, the lack of the same is not a damper to the enthusiast of young library & information science professionals in the making. They have the idea and vision of what the Web can do and means to them.

7.2 Librarian As Facilitator

The availability of electronic documents on the Internet and the support extended by World Wide Web to access these documents have recently increased tremendously. Several print journals have shifted their platform to Web, which includes free and paid publications. In this scenario, it is imperative for the traditional librarian to acquire necessary skills in effective use of modern gadgets and associated software to locate and retrieve the widely dispersed information in the cyberspace. Not only he has to acquaint himself but also gain a degree of proficiency to effectively guide and train the information seekers in their usage. Thus, the traditional librarian has to play the role of facilitator in identification, gathering and arranging information infrastructure such as network access, software access, licenses and passwords to use charged resources like First Search, UnCover, Ovid etc. The role of the facilitator if characterized by qualifications would be closely related to the ones of the librarian. It is likely to emerge that the traditional intermediary function of the librarian by its nature could create a basis for the role of the facilitator in a networked community. Normally, the facilitator does not solve the total information problems of users. He addresses the communications and information needs of the users in one way or another and makes an identification of resources for fulfilling the needs of users.

7.3 Librarians As End-User Trainer/ Educator

The number and variety of information sources available, whether locally or remotely via the WWW have increased greatly, and users in many cases have not been able to keep up with all of the choices open to them. Few users of the libraries are effective and efficient in accessing information resources. However, no matter how sophisticated interfaces and search engines come up in future information access systems, people still would need to be educated regarding their usage. Users will need to possess an understanding of essential information gathering skills and tools. The areas in which training is given by the librarian would include not only the use of electronic primary journals from many different publishers, but also the use of abstracts and indexing databases, databanks, CD-ROM publications and document delivery services. End-user training aspect of librarian would also include organization of information resources, search strategies, tools, information searching skills, awareness of resource constraints and alerts to users on new resources in their subject area. The librarian therefore, has a critical role in the digital library of future as educator or end-user trainer.

7.4 Librarian As Web Site Builder or Publisher

The traditional skill of a librarian in locating, evaluating and organizing the information would be of immense use in the creation, development and content filling of a Web site for the organization and library. Web site of an organization provides access to external resources, where Web pages specific to their discipline are available. Managing organization's own information on the Web site includes details of course information, directories, statutes, annual reports, etc., The role of the librarian while creating a web page is to deliver information about the library and its services like hours of service, location of services, details of library staff, library policies, an interface to the library Online Public Access Catalogue (OPAC), etc.

7.5 Librarian As Researcher

Librarians are highly skilled in the research process and possess a unique knowledge of the breadth and depth of information resources in various subject specialties. Librarians are increasingly going to participate in and be critical members of research teams. By facilitating access to information – finding it, analyzing, synthesizing, and packaging - librarians would move to the beginning of the information production cycle, playing a more substantial role in the information creation process. Teams within an organization should have an information professional who is responsible for the information gathering skills of the team.

7.6 Librarian As Interface Designer

Interface design is going to become increasingly important and increasingly relevant to the way people access and use digital technologies. A beneficial way for librarians to break out of their insularity is to become much more closely involved and collaborate in the work of computer and information scientists in tasks such as design, organization, development, and maintenance of digital library repositories, interfaces, search engines, networks and Web documents. Librarian can help in the design of technology-based information services and share their intimate knowledge of what users want and need as they have years of experience in helping patrons utilize electronic media and subsequently using Internet and World Wide Web.

7.7 Librarian As Knowledge Manager/Professional

Knowledge Management (KM) involves the identification and analysis of available and required knowledge, and the subsequent planning and control of actions to develop knowledge assets so as

to fulfill organizational objectives. Organizations worldwide are realizing the advantages of enlisting librarians in the KM systems. Librarian as a part of KM system can effectively participate in the process of knowledge creation which include mechanisms for knowledge capture, exploitation and protection besides in required infrastructure creation by the virtue of capabilities gained as Information Managers of the organization. The creation of the knowledge center in an organization normally involves contributions from three groups of experts such as users, knowledge professionals and technology experts. Knowledge professionals are the individuals in the knowledge center who have the skills, training and know-how to organize knowledge into systems and structures that facilitate the productive use of knowledge resources. They include librarians, managers, archivists, and others. Librarians to become Knowledge Managers or Professionals should possess variety of talents and perform the work with high level of skill and expertise. They should be able to extract, filter and disseminate vital external knowledge, and work side by side with users in collecting and analyzing strategic intelligence throughout the organization. Librarians, in future, would move from the background to the center of the organization. They would shed their traditional role as a part of support group, uninvolved in any critical functions, to a prominent position to jointly hold the reins of knowledge management with users and the technology experts. They would help steer and shape the knowledge policies, structures, processes, and systems that will nurture organizational learning.

7.8 Librarian As Sifter of Information Resources

Normally, sifter or siftware is described as "software programs to extract unknown, valid, and actionable patterns, associations, changes, anomalies, and rules from large databases". This process is also known as "Data Mining". The Internet and Web provide access to vast information resources. The term "sifter" may be used for the skilled librarian who helps users make sense and order of the resources. The future belongs neither to the conduit or content players but to those who control the filtering, searching, and sense-making tools to navigate through the expanses of cyberspace. In another words, the librarian can be a key player in the emerging scenario.

8. DIGITAL LIBRARY

Digital library has certain characteristics, which make them different from traditional library. It has expansive and accurate system of searching with large volumes of text, image and audio-video resources. Digital libraries do not need physical space to build collection and it can be accessed from anywhere, any time. Different people can access same source at the same time. The advantages of digital libraries are mentioned herein below:

- Preserve the valuable documents, rare and special collections of libraries, archives and museums.
- Provide faster access to the holding of libraries world wide through automated catalogues.
- Help to locate both physical and digitized versions of scholarly articles and books through single interface.
- Search optimization, simultaneous searches of the Internet make possible, preparing commercial databases and library collections.
- Offering online learning environment.
- Making short the chain from author to user.
- Save preparation! conservation cost, space and money.
- Digital technology affords multiple, simultaneous user from a single original which are not possible for materials stored in any other forms

9. DISADVANTAGE OF DIGITAL LIBRARY

New technology has brought many advantages but simultaneously it also has certain disadvantage

- Costly affair
- Technology obsolescence (Hardware & Software) Storage media relate
- Dominance of data creators and publishers Trained manpower
- User education and training
- Security against hacking & sabotage

10. SKILLS, KNOWLEDGE, COMPETENCIES REQUIRED FOR LIS PROFESSIONALS

The basic goal of library and information profession has always been to provide access to information to those who need it. The activities realizing this goal have evolved and transformed over the years. This includes - Available technology, and need of an evolving information society. Information activities have been guided by the developments in the field of storages, presentation and archiving of knowledge, collection development and organization of knowledge, information explosion and computers in information retrieval. Librarian and information professional involved in information gathering, storage, retrieval and dissemination on one hand and on the other hand the computer specialists who supports the library and informational professionals in this endeavor. For successful implementation of Digital Library, it is essential that LIS professionals are well trained and possess requisite knowledge and skills in this respect.

I) Knowledge & Skills

Librarians need to know understand -

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

II) Competencies that required to possess in LIS professional

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

III) Technical Knowledge required

- Operating systems - Windows, UNIX, LINUX.

- World processing, Graphics, Spread sheet & Presentations.
- Database Management Systems including the skills in Bibliographic Database Management Systems.
- General purpose programming, Networking
- Web page Development and Content Management
- Information Retrieval software for online, CD-ROM and Internet.
- Library software packages, acquaintances with Digital Library TOOIS.

11. TRADITIONAL ROLES AND SKILLS

The information that users require may be accessed differently but the skills information professionals need to manage this information can be adapted from established practices. There is no denying that this is a new global library environment and it is one in which librarians are still finding their way. However, the foundations of the profession and the skills and roles associated with it will help to ensure librarians survival. The core skills traditionally associated with information professionals which include information handling skills, training and facilitating skills, evaluation skills and concern for the customer are all still relevant. These skills cover cataloguing, classification, indexing, enquiry work and user education all functions which if managed by librarians will help to make the Internet an easier place to navigate. Librarians in all sectors have built up roles and library services based on collections and users needs and according to Creth the "values that are the foundation of the library profession should remain the same into the next century, values of service, quality, universal access, and co-operation". It is the way in which these values are translated into operations and activities that will undergo substantial change.

Lancaster correctly states that in order to justify its existence in the electronic world, "the library must continue to perform one of the most important functions it now performs in the print-on-paper world: to organise the universe of resources in such a way that those most likely to be of value to the user community are made most accessible to this community, physically and intellectually. The vast amount of information available in a networked environment suggests that there is more than ever before a role for trained intermediaries with search skills, abilities to analyse and evaluate resources and match needs with sources. The traditional library skills mentioned above should be reassessed and their value to information services in the electronic environment applied. For example, the skills of cataloguing and classification can be used to improve the end users experience of networked information retrieval. The creation of meaningful metadata files based on cataloguing principles can help users find needles in the Internet haystack. The creation of catalogues including electronic resources can ensure access, authenticity, reliability and validity of networked resources.

12. CONCLUSION:

The role of librarians is continuing to evolve with the integration of the Internet into the profession of librarianship. With the changing age of libraries now the library sources are also has been growing day by day, especially in the form of digitalized or electronic. Though it is difficult to predict with certainty how active the role of librarians would be in this evolving age, it can be said with confidence that their services cannot be dispensed with because they have the necessary qualification and historically the first right to attend to the information needs of the seekers.

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Librarianship in Digital Age

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Abstract: Library science is an interdisciplinary science incorporating humanities, law & applied science to study topics related to libraries, the collection, organization, preservation & dissemination of information & the political economy of information. Library science has included archival science. This includes how information resources are organized to serve the needs of selected user groups, how people interact with classification systems & technology, how information is acquired, evaluated & applied by people in & outside of libraries as well as cross culturally, how people are trained & educated for careers in libraries the ethics that guide library services & organization. Academic courses in library science typically include collection management, Information systems & Technology, cataloguing & classification, Preservation, reference, statistics & management. Library Science is constantly evolving by incorporating new topics like Database management, Information architecture & knowledge management.. Now librarian must be able to identify & locate information. Sources that are outside his/her library. In such a new environment a new set of skills are required. E.g. accessing a digital library needs an understanding of its structure & access methods. Digital library development needs the library professionals with additional qualities possessed such as team leader for web designing, WiFi network administration, Open source software management, RFID technology etc.

1. INTRODUCTION

1.1 Concept Of Information Age, Digital Age & Knowledge Age

INFORMATION AGE: The period beginning around 1990 & noted for the abundant publication, consumption & manipulation of information especially by computers & computer networks.

DIGITAL AGE: Refers to bringing compression & other processing enhancement of information or anything connected with communication among others.

2. LIBRARIES IN DIGITAL AGE

New libraries can try to go beyond being paperless versions of traditional in at least 3 ways.

- Freed of the need to store copies of sometimes rare documents they can focus more on services that will help the readers find and organic information in vast virtual collection
- Freed of the need to maintain collection in locations physically near their communities of readers, they can plan to aggregate virtual holding into more encompassing complete and up to date collection
- Freed of the dominance of static print (audio and video can be digitized as readily and can be digitized as readily as can typed text) ; digital library can grapple with the complexity of representing and cataloguing new multimedia documents.

3. NEED FOR THE STUDY

Industrial revolution changed our society from an agricultural society to an industrial society. Computer has changed the industrial society to an information society. Now the Internet is changing our society from information society to a global society. The human society is undergoing a sea change due to phenomenal growth of information and application of Information technology in the form of high degree of computerization & transmission of electronic information. In the information society not only a huge amount of information is produced but also tremendous developments in the computer

hardware & communication technology along with the necessary software tools have made possible the quick retrieval desired information, merely on the pressing of buttons. This paper aims to study changing aspects of Information society in the 21st century & how professionals are accepting changes & how they are trying to become competent to face the changes.

4. CHANGING FACE OF THE LIBRARY DUE TO INFORMATION TECHNOLOGY

The advent of the computer has made possible the creation of many new types of documents. Broadly these are referred to as Electronic documents. Electronic documents are acquired in computer format & published by releasing them to a central database.

4.1 Web Ineterfacing Of Traditional Searches

Online searching is the term commonly used to describe the most typical area of library & information professional's work. Significantly online vendors such as Knight Ridder's DIALOG & Data Star; OCLC etc. have moved towards the stage where interfacing has become the standard. Search results can be downloaded directly via the browser software. Moreover, documents can be saved either HTML or tagged format.

4.2 Imaging

Libraries of today are having collections which comprise of photographs, maps, detailed artworks, architectural sketches & engineering drawings. With the availability of hi end servers; large bandwidth; Image navigator software, there is no technical constraint to produce a complete online solution for this specialized collection. Images are scanned & compressed using a special encoding process, producing an image that can be loaded quickly into a standard web browser.

4.3 Digital Environment

Many libraries in India are thinking to digitize their resources. Digitization is a process through which information is converted into digits for computer use. The conversion of information into this form makes it possible to transmit information through one channel and to reduce the risks of distortion. Moreover the use of digital language facilitates the integration of computers, telecommunications & some other technologies. This convergence results in easy handling of information at quicker speed with more flexibility, improved quality & lower costs. These benefits have attracted policy makers of our country to see the launch of various digitization projects in India. Consequently, many libraries are in the process of undertaking the digitization of resources encompassing rare books, periodicals, patents, manuscripts, photographs and other pictorial images.

4.4 RFID Technology

Libraries & Information centers are often faced with the dilemma of check-out/ check-in of the resources. An automated environment has helped circulation staff to a large extent but still long queues particularly during peak hours create chaotic scenes in many libraries. Slow pace of transaction at the circulation counter result in loss of the tempers by many users. In a fully automated library, check-out & check-in of the material could be made faster with the help of Charged Couple Device scanners. Nevertheless, these hand held scanners do not give liberty to the users for self check-out/ check-in of the books. However, with the installation of self-checkout machines, apply self-service technology to the book borrowing function. Self Return Book drop allows depositing book through an external book return chute. The moment it is returned, status of the book in circulation database is updated

thus allowing other borrowers to check out the returned book right away. Radio Frequency identification (RFID) technology plays a significant role not only in updating the databases but also in Tagging and verification, shelf management and stock-take, and also in Theft deterrent system. Despite the many benefits , handful of libraries have, so far , embraced this technology, lack of knowledge on the part of librarians may be cited as one of the main factors behind it.

5. DEVELOPMENTS OF DIGITAL LIBRARIES

Digital technology as applied to telecommunication has resulted in the possibility of digital compression & better utilization of radio frequencies which was one of the factor that was delaying the growth & popularity of wireless communication. It has helped to bring together data pictures & voices which has helped us to move into the era of multimedia.

Digital libraries are capable of managing content from multiple locations & provide a way to enrich the Teaching Learning Process from distance. Digital library is a global virtual library which is also known as "Network of Electronic libraries."

In simple words, a digital library means the libraries which are accessible through Internet. They are network based distributed systems with individual servers responsible for maintaining local collection of digital documents ranging from set of Electronic texts to video on demand services. They would provide a coherent/ consistent view of many repositories of Information allowing users to access, connectivity & interaction with information with no regard to geographic location or time.

6. LIBRARIANSHIP IN DIGITAL AGE

To do the professional work effectively & efficiently informational professionals need to develop following skills:

6.1 Information professionals

- Identification of user's information needs.
- Analysis & anticipation of user & organizational information needs
- Ability to organize and store information for effective retrieval.
- Training, education & consultancy skills.
- Knowledge delivery mechanisms.
- Ability to add value to information.
- Methods of disseminating information.
- Awareness of technology skills & subject expertise.
- Knowledge of disparate information resources & how to access/integrate them.
- Familiarity with research methods.
- Ability to evaluate information.
- Knowledge management.
- Knowledge of legal, economic & political aspects of information.

6.2 Information Management Skills

Information is considered the most important resource and that's why in the context of decision making, information is also treated as the blood of management. In the absence of awareness regarding

various kinds of management, the information manager can't enjoy the right benefit of the right information in the undertaken stage of decision making. So, management skills are required by information professional at various stages of the information cycle. Few of theses skills which are of utmost importance include:

- Understanding the organizational culture
- Project management
- Change management
- Strategic planning
- Financial management
- Human resource management
- Communication skills
- Marketing skills
- Vision and creativity
- Liaison and negotiating skills

The above mentioned skills are designed for a traditional library keeping in mind. However impact of IT in Library science & services needs skills related to technology & technically skilled courses will enable library professionals. The main competencies for library professionals in I.T / Digital Age are basically sharing of knowledge resources & establishing clear picture of research & development of library as a part of domain institutions/universities. This leads professionals strengthened of advanced emerging technology, services & policies in terms of importance & principles of the profession.

A number of professionals today are getting compelled to improve their skills to enhance their performance within the workplace & stay abreast of the emerging trends in technology, developments & technological changes defining their specialized responsibilities. Besides fulfilling the existing requirements of the jobs, they also need to continuously build their domain specific to perform better at work. For this they have to have knowledge of Information and Communication Technology.

Recent trends in& rapidly developing ICT are creating new opportunities & challenges. The users attitude towards accessing & usability of information in digital environment has changed remarkably. The application & integration of ICT service has changed perception of the people about information landscape in academia, research, consumer education & public in using information to solve their problems in their everyday activity. There is need for the Library professionals to study & practice of various ICTs like servers, desktops, clients, workstations, networking topology, TCP/IP suites, IP phones, IP cameras, Hubs, routers etc.

6.3 Web Designing

Library professionals should have knowledge of HTML, Java script, VB Script will help them to become highly qualified & service oriented professionals who will meet the manpower requirements & to help the users to meet their information requirements at national & global level & customizing their own web systems according to the users requirements & information benefits.

6.4 Search Engineering Basics And Information Seeking

Librarians were the ultimate search before the search was reinvented with web. They are trusted credible sources for historical information & pioneers & innovators of taxonomy of information.

Librarians witness search for & organize the knowledge. Online research & the power of web have made accessing information only fingertips away from all of us.

Research librarians help people doing research to find the information they need through a structured conversation called a reference interview. Digital librarians should have core knowledge of advanced information searching techniques & various information seeking strategies.

6.5 Open Source Software Management

During digital libraries development, financial or budget aspects is very important & considerable. Open source digital packages are gaining popularity now days. To build a digital library under economical conditions Open source software is preferable. The aim of the freeware software is to empower users particularly in universities & other public service institutions to build their own digital libraries. It is well established fact that lib. Professionals should gain knowledge of open source software management & administration, Identifying & use of appropriate open source software & tools to deliver or provide access to quality resources for teaching, research & practice of users

6.6 Computer Networks

Basic target of digital libraries is information sharing. Information sharing is achieved through computer networking & communication. Digital librarian plays a major role in deciding in establishment of problem free network & its easier use. This normally includes deployment, configuration, maintenance & monitoring of users & active network gear, switches, routers, firewalls etc. network administration commonly includes actions such as network address assignment, assignments of routing protocols &routing table configuration as well as configuration of authentication & authorization, active directory services. Network specialists & analysts concentrate on the network design & securities particularly troubleshooting and/or debugging network related problems, maintenance of the network's authorization, infrastructure as well as network backup systems. These works should be inspected by digital librarian. Hence knowledge of computer networking, information sharing, securities from unauthorized access of data, prevention of attack of viruses on digitized data & Trojans etc are essential to digital librarian

6.7 As a Library Consultant

Since every system tends to face certain problems at one time or the other time, & Library is a system, service organization aiming at providing information needs of the users at various levels. There are various developments taking place in the field of science & technology which may create problems in handling/managing information for library personnel. To get rid of the problems Lib professionals need to consult someone who is expert in the field. The concept is not new. It is a common phenomenon for many professions & institutions. Consultancy is brought into organization to provide advice on specific problems about which there is either adequate internal expertise or an outsider's view is considered. The help of an expert is often in many institutions with a view to make improvement in existing system.

7. CONCLUSION

In this changing scenario Librarian is going to be highly skilled professional whose total commitment would be as a processor & disseminator of information & the user. His global participation in the universe of knowledge will rank him as one of the highly paid professionals in the world. Those who cannot come up to the standard will remain oscillating between the roles of the archivists & the roles of the store keepers of Information.

In the 21st century librarian is going to work more as a:

- Disseminator of digital information rather than the custodian of Information.
- Trainer in Information technology than as a passive learner
- Researcher in information technology to compete with the rest of the Professionals than the user of age old library techniques;
- Promoter of Extension activities in regard to the creation of MSS, publication of Multimedia & other documents & the distribution of documents than simply a user of published documents;
- Master of the contents of the world resources than a librarian of a single library

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Librarianship in the Internet Age

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Abstract: Today fast paced developments in information and communication technologies have brought turmoil in the world of libraries and thereby library professionals. The role of the librarian has also undergone drastic change as the knowledge navigator and professional from mere documents collector and provider. Also it has opened the door for many opportunities for the library professionals in the future to come. Library Professionals are required to do SWOT analysis of their libraries and themselves in the information technology context. Also they need to acquire competencies to survive in this electronic age. This paper attempts to focus on the impact of Internet and World Wide Web on the traditional library profession and on the opportunities and options open to the librarians.

1. INTRODUCTION

"Change is the law of life. And those who look only to the past or present are certain to miss the future." (John F. Kennedy) Whether we like it or not, the role of the librarian in the Internet Age has changed, is changing, and will continue to change. These changes will occur rapidly and much depends upon our ability to respond to change. Historically, the role of librarians has evolved throughout the centuries at a much slower pace. Librarians have always responded well; but, those were slow changes.

Traditionally librarian is known as a person located in the library building handling the tasks like acquiring, organizing, preserving the printed documents and helping the readers in locating the information needed by them. Librarians have been information providers for centuries. Typically Librarian's role in pre-internet era was as

Custodian: Selects, organizes and services print and other media.

Guide: Assists users in searching and critically evaluating information resources

Public Relations Officer: maintains good relationship with management, users,

other libraries and outside organizations.

Over the years role of the librarian grew from that of a collector and preserver of information resources to a professional involved in very complex issues of organization, the dissemination of and access to information. Today, it has further evolved to encompass the escalating technological developments.

Advancement of information technology and existence of Internet & World Wide Web have largely affected the libraries and information centers.

2. INTERNET MANIA

Here the question arises that why this internet and world wide web is becoming so popular? Why it has all pervasive influence? It has changed overall perspective of information handling across the globe.

The most fundamental and powerful features of the Internet and World Wide Web influencing Libraries & Library Professionals are:

1. Easy connectivity through ordinary personal computers and local phone numbers;

2. Provides facility to exchange electronic mail with the accounts on the internet.
3. Allow publishing and making frequent updates to on-line documents, and receive direct feedback on those documents via E-mail.
4. Connect with a diverse, global audience, a community defined not by geography, but by interests.
5. Keeps you abreast of the latest news and developments in your profession.
6. Reference other Web resources easily via hypertext.
7. Provides access to otherwise obscure information not readily available in other media.
8. Allow to download useful software and documents at little or no cost.
9. Support to distribute information in a number of different sites all over the Internet.
10. One can access multimedia information that includes sound, photographic images and even video.
11. It is changing the way people access information, and opening new possibilities in areas such as digital libraries, virtual libraries, scientific information retrieval and dissemination, education, commerce, entertainment, government and health care.

Because of all the above fascinating features internet has brought a tremendous change in the way information is stored and accessed. This has brought about a change in the concept of libraries, their collection and services. Many new terms viz. Digital Librarian, Libraries without Walls, Virtual Libraries are emerging to describe the libraries of digital age.

The paper collections have given place to networked, computer resident, user searchable collections like bibliographic databases, Online Public Access Catalogues (OPAC) eliminating the need for the user to visit the library building. With the digitization of ever increasing number of collections and advances made in computer/communication hardware and software; seamless access to digitized information located in geographically diverse locations has become a reality. The walls of library are thus pulled down. The access of information available anywhere on the globe has brought people so close that the phrase "Global Village" is coined to describe the scenario. The INTERNET AGE has brought in its wake new flavors in the form of digitizing not only printed material but also pictures, maps, scenarios, paintings and sounds and presenting them all in a lively show in a theatre like environment. Where do librarians stand in this scenario and where their profession is headed is the nagging question faced by one and all in the profession.

3. CURRENT SCENARIO: WHETHER LIBRARY & LIBRARIAN'S ARE GOING TO SURVIVE?

The question of survival of the libraries and librarians in the new environment of exponentially growing Internet and World Wide Web has been addressed by a number of authors. On one hand, it has been predicted that librarians would play a more dynamic role than at present, in the new internet and web environment exploiting its benefits for providing better service to their users. A new species of librarian that is e-Librarian will emerge, who will be a specialist in searching information on the Internet, as well as will make it available thorough licensing, sharing or by other means.

On the other hand, many firmly believe that library and library professionals will be no more required and so that it is the question of survival for them. But future may not be like the acute prediction by the scholars.

Society is not ready to abandon the library, and it probably won't ever be. Libraries can adapt to social and technological changes, but they can't be replaced. While libraries are distinct from the

internet, librarians are the most suited professionals to guide scholars and citizens toward a better understanding of how to find valuable information online. Indeed, a lot of information is online. But a lot is still on paper. Attention should be given for improved staffing and technology for libraries. Today, more than ever, libraries and librarians are extremely important for the preservation and improvement of our culture.

The paper based libraries will continue to exist with digital libraries and human librarian is essential as well as virtual librarian. Despite their perceived obsoleteness in the digital age both libraries and librarians are irreplaceable for following reasons:

3.1 Not Everything Is Available On The Internet

The amazing amount of useful information on the web has, for some, prompted the false assumption everything can be found online. It's simply not true. Google Book Search recognizes this. That's why they're taking on the monolith task of digitizing millions of books from the World's largest libraries. But even if Google does successfully digitize the sum of human knowledge, it is unlikely that the sum of contemporary authors and publishers will not allow their works to be freely accessible over the internet. It is already prohibited by law to make copyrighted books fully accessible through Google Book Search; only snippets.

3.2 Digital Libraries Are Not The Internet

A fundamental understanding of what the internet is and what it isn't can help more clearly define what a library is, and why libraries are still extremely important. There is the difference between "Online Collections" and the "Internet or Web Sources". The internet is a mass of largely unpublished materials produced by organizations, businesses, individuals, experimental projects, entrepreneurial webmasters, etc. "Online Collections" however, are different. They are typically provided by libraries and include materials that have been published via rigorous editorial processes. Works selected for inclusion in a library catalogue undergo inspection from qualified staff. Types of materials include books, journals, documents, newspapers, magazines and reports which are digitized, stored and indexed through a limited-access database.

3.3 The Internet Isn't Free

All the information available on the internet is not free of cost; rather access is restricted to expensive subscription accounts, which are typically paid for by libraries. Visiting the library in person, or logging in to the library through your member account, is therefore the only way to affordably access necessary archived resources.

3.4 The Internet Complements Libraries, But It Doesn't Replace Them

Librarians guide people in finding information; users are looking for through news, journals, books and other resources. Interestingly, the World Wide Web is among these resources as yet another approach to finding information. But it's not a replacement.

3.5 Libraries Aren't Just Books

Technology is integrating itself into the library system, not demolishing it. Pushing this trend to its logical extreme, we could eventually see libraries' entire stacks transferred to databases, and have books only accessible digitally. So where does that leave librarians? Are they being overtaken by technology, the timeless enemy of labor? In fact, technology is revealing that the real work of librarians is not just placing books on bookshelves. Rather, their work involves guiding and educating visitors

on how to find information, regardless of whether it is in book or digital form. Technology provides better access to information, but it is a more complex tool, often requiring specialized know-how. This is a librarian's specialty, as they dedicate themselves to learning the most advanced techniques to help visitors access information effectively.

3.6 Like Businesses, Digital Libraries Still Need Human Staffing

Even online businesses rely on quality support for better sales and customer satisfaction. The availability of email, phone and live chat services improve the experience of people seeking goods and services. The same goes for people seeking information.

In return for paying taxes or library fees packaged with University tuition, library members should expect reliable "customer support" in exchange for their dues.

Librarians are indeed very important in servicing their visitors. And still today there is no equivalent replacement to the library, which provides access to mountains of content that is not available through search engines.

3.7 Eliminating Libraries Would Cut Short An Important Process Of Cultural Evolution

The library that we are most familiar with today a public or academic institution that lends out books for free is a product of the democratization of knowledge. In the old days, books weren't always so affordable, and private libraries, or book clubs, were a privilege of the rich. This started changing with more public libraries popping up. It has taken knowledge to the masses and therefore supported cultural evolution

3.8 The Internet Is A Mess, Can Be Hard To Isolate Concise Information On The Internet

The internet in very few ways resembles a library. A library provides a clear, standardized set of easily retrievable resources. Despite improvements in search technology and the creation of amazingly comprehensive sites like Wikipedia, the internet is still, in many ways, flooded with sites from all sorts of sources. The web is like an overpopulated Wild West. It is very difficult to find precise information one is looking for over the internet in stipulated time.

3.9 Not Everyone Has Access To The Internet

In less developed or developing countries like India, library access is often the only clear-cut way for an individual to conduct serious research. Online access may be much more difficult to attain than library access. A public library may have but one computer, while other internet access points may charge someone who simply doesn't have the means to pay. Even if internet access is obtained, the lack of technological education in poorer areas will render the technology much less useful than it would be for the person who has more experience navigating the web.

3.10 The Paper-Based Library Will Coexist With The Digital Library

Despite numerous digitization projects, electronic media is still not as dominant as print media. There are still a lot of printed pages in our libraries, and we expect this to be the case for a long time to come. The paper-based library will coexist with the digital library for the foreseeable future, because electronic publications are not developing at the expense of print media, but in addition to them.

4. THE EFFECTS OF INTERNET ON LIBRARY ENVIRONMENT

With the advent in Information Technology, the FACE and FATE of Libraries and Librarians is bound to change. The environment in which librarians work is changing in terms of greater access to

a range of information, increased speed in acquiring information, greater complexity in locating, analyzing and linking information, constantly changing technology and adaptation, lack of standardization of both hardware and software, continuous learning for users and staff, management of financial investment for technology. Many libraries are in transit from the traditional towards the digital library. The change factors can be summarized as follows:

- Geometric increase in quantity of Information
- Greater access to information sources on/via the web/internet
- Increased speed in acquiring and disseminating information
- Constantly evolving IT (both hardware and software)
- Need for bigger financial investments to acquire electronic resources
- Information world is undergoing transition from Library-centered to an information centered entity
- Shift from a paper based environment to a predominantly digital interface using search engines, databases, data mining etc
- Transformation of library from an institution to the library as an information provider with IT skills specialists functioning in an automated environment
- Need for collaborations with different type of institutions, information professional and many others
- Moving from the concept of acquisition to the concept of access i.e. instead of purchasing information sources, licenses for access are paid for
- Awareness about intellectual property rights and judicious use of copyrighted material

5. WHERE DO LIBRARIANS STAND? : SWOT ANALYSIS

It will be interesting task for us, library professional to soul search as to where do we stand in this rapidly changing information world.

The field of librarianship has seen the technology grow from handwriting to electronic pen, to typewriter, to word processor, and now to computer. The technology changes have been affecting almost every type of library including public, school, academic and special. Very few libraries have been immune to technology. Librarianship is one of the oldest professions in the world and the times call for a new breed of librarians, those who understand and integrate technology, information and learning into a new model. The following are strengths and weaknesses inherent in the library science profession.

5.1 Strengths

- Librarians are creative, flexible, adaptive and service-oriented.
- Librarians are skilled in information literacy and use their knowledge to solve information problems
- As Librarians assist so many users across many subject areas, librarians often see connections and have an overview perspective not available elsewhere
- Librarians are able to identify, evaluate and organize print as well as electronic information resources.
- Librarians understand what the user wants and are very close to the user information requirements than other professionals.

- Librarians are able to train users to search and retrieve information, which is a part of user education in his profession.
- Librarians believe in the value of information sharing and networking.
- Librarians are experienced in knowledge management concepts, which are most identical to the classification, cataloguing, documentation, storing and making information available on networks.
- With their training, librarians are more adept than the average citizen at using search engines to locate and decipher reliable data
- Librarians provide 'Human touch' while helping users which is far more significant than a PC mechanically pouring the information.

5.2 Weaknesses

- Libraries are expensive and require physical space. The cost of books and electronic subscriptions continues to rise, and there always seems to be a need for more office space
- The fear among the fraternity is that they their very existence is challenged by the advancement in technology.
- Librarians being deficient in technical knowledge of computers, technology etc, are not being able to handle them very efficiently.
- Librarians are no longer acting as controllers of information especially while using Internet.
- Misconception among the users about the availability of the information on the net. Users are under impression that they can get everything they need on the internet very easily.
- Feedback mechanism in libraries is not systematic and lack of initiative in this regard causes the inability to understand user's needs.

5.3 Threats

- Idea that anyone can search online databases obviates the need for a librarian.
- The Internet "has all the information for free"
- The Internet is more convenient; don't have to go to the library
- The Internet is more fun
- End-user searches
- Publication costs and increases
- Administrations' lack of understanding of the library
- Standardization of the information available on internet
- The librarian stereotype is still strong, and too many view libraries as outdated and as overhead only.
- An institutional culture that does not value the role of the library may discourage potential users, thereby reinforcing the negative perception.

5.4 Opportunities

The Internet to an has extent helped spur more people to use the libraries because it has increased our hunger for knowledge and information There are numerous opportunities for the librarian in Internet and Web environment in providing information services easily, timely and appropriately to the users.

- End of borders: The Internet enables the library to provide information services and access to materials online 24 hours per day, 7 days per week (24/7). People with Internet browsing capability at home or anywhere else can examine the online catalog of library holdings, place reserves on items that they would like to borrow, and renew items that are due or overdue—all as functions of the integrated library systems that are available to the public via the Internet 24/7. Therefore working hours, lending hours, lending of valuable documents are no more constrains.
- User Feedback: In recent years use of softwares specially designed for libraries is on the rise. Also many libraries use sophisticated database management systems and information systems to organize their collection. With the effective use of these, librarians can generate a variety of data such as popular documents, user statistics etc. Today's student fraternity is internet savvy, their feedback and suggestions about library services can be gathered through survey conducted by e-mails, blogs or polls on internet. This valuable feedback will be helpful in the overall management of libraries.
- OPAC : Today's online catalog has vastly enhanced search and retrieval functionality, further enabling public access to the collections
- Innovative Services: With the use of internet libraries can think of providing many innovative services such as Online Reference Services via e-mail and chat. Many users prefer to make an inquiry via e-mail, rather than a telephone call or visit that may result in a lengthy wait. They can offer "Webliographies," an especially wonderful and high-impact service through which annotated lists of linked sites organized by topic for users can be provided. Librarians should validate and compile these lists, ensuring their appropriateness, accuracy, and timeliness, none of which can be assured about the results delivered by commercial search engines. Also librarians can think of sending e-bulletins, creating local databases, providing virtual library tours to its patrons
- Exploring New Avenues: Usually library is funded and maintained by the parent body or organization and usually regarded as burden as it usually does not generate any income. Through the internet, with the same available infrastructure and manpower library can reach to the outside clientele and provide them the services against a fee.
- Universality of the collection: All of us must have experienced some time or the other, waiting for the required document as it is already on loan. Availability of electronic documents can be accessed by multiple users at the same time. Also library need not waste funds in acquiring multiple copies of the documents.
- Librarians can take the lead as information managers and in knowledge management. Librarians should help the parent institution in dealing with technology and the flood of information it has brought.

6. NEW ROLE OF LIBRARIAN IN E-AGE

Librarians have traditionally been concerned with certain functions, and most of these have their parallels in the internet and electronic publishing era. It is often suggested that some or all of these functions become redundant in an era when increasing amounts of information are available directly to users via the Internet. It will not be correct to say that the role of the librarian will change entirely 360 degrees. Only those must be viewed in new light adding a new dimension to it. Librarians can play very important role in their organizations in following manner:

6.1 Provider Of Intellectual Access To Information In Any Format

Providing intellectual access to information is a role librarians have filled for a long time. Traditionally librarians have done this via print-based resources. During the second half of the twentieth century the range of available resources expanded to include microform, video and audio formats. The final decades of the twentieth century witnessed a further explosion in formats, and libraries can now offer information in the form of print, audio, video, microforms, numeric, computer programs, or multimedia composites of each. For librarians, the most important issue is to provide the information in whatever form it is packaged

Librarians and patrons will no longer be restricted to a single entity where everything is stored, but rather librarians will be able to offer a range of services and collections, linked together or made accessible through electronic networks.

6.2 Evaluator Of Information Sources

There is an increasing diversity of information resources from which to choose the most appropriate medium, will be the challenge for the librarians in the coming period and that librarians must widen their selection processes in order to decide on the right medium for each situation. There are numerous free resources available on the web. Whether or not to include these in the library catalogue is a very important issue for the librarians to decide upon.

6.3 Preserver of Information

The issue of preservation in the virtual library environment is a complex one. Librarians and archivists have long-established standards and guidelines for the preservation and storage of print materials for long-term survival. The preservation of electronic and digital information resources creates new dilemmas for librarians and archivists.

Digital media is in its Infant stage, at least for Libraries, so there are no proven and tested methods for its preservation. One of the significant issues affecting preservation of digital information resources is the very technology which creates them. These technologies have an increasingly rapid obsolescence and the preservation of digital information is dependent on ensuring that the software and the mediating technology are also preserved.

6.4 Knowledge Navigator

Information retrieval is the most important skill a librarian. The increasing sophistication of search engine design is creating an environment where anyone can, at varying levels of efficiency retrieve information from the internet. Without professional guidance many searchers, particularly novice internet-users, do not exploit the full potential of search engines and consequently do not retrieve all the relevant information available to them.

The librarians make a significant contribution, often defining the search, clarifying the researcher's goals, and helping the researchers to understand their needs. In providing access to information, the librarian in the digital environment must consider the requirements of any digital resources, any hardware or software necessary, the most effective way to refer patrons to the resource, and whether availability is limited to a defined user group.

6.5 Instructor/Trainer

One of the tasks that come with technology is training people to use it. Librarians can play very import role by imparting training to users may be in the form of teaching computer basics, introducing to them various devices, tools and techniques used on internet etc.

6.6 Search Assistant

Librarians and information officers often carry out information searches on behalf of research and managerial staff. In the electronic era this will undoubtedly continue to be the case, as many members of other professions have neither the time nor the inclination to carry out searches themselves. Though users can conduct simpler searches themselves, for more complex searches librarian's help will be required to sift through the ocean of internet.

6.7 Pollster

Librarians are well aware of the research methods and their training makes them expert in locating the recourses as well as evaluating them in various fields of knowledge. Librarian will be the important link in the information transfer cycle and will play the major role as the part of the research team.

6.8 Knowledge Manager/ Professional

The information explosion has created far more information than any one library can contain. The librarian is responsible for locating, acquiring, disseminating and tracking information resources of many types. This job might include database searching, interlibrary loans, monitoring Internet newsgroups, or maintenance of a computerized library information system.

7. SKILLS REQUIRED FOR THRIVING

The role of librarian has changed in the digital library era. It is, therefore pertinent on the part of the librarian to acquire new skills required for developing and managing the digital libraries. The library and information professionals are required to acquire such knowledge and skills as the library is one of the highly IT influenced service profession. The empowerment of library and information professionals with IT skills is aimed at providing services that are expected of from the clientele in the new environment. Librarians should imbibe following qualities and skills to thrive professionally in an era which is going to come:

7.1 Professional Competencies:

- Optimum utilization and management of resources Knowledge Resources (books, journals, Internet) Teleological facilities and resources (computer, online catalogues, websites etc.) Financial resources (Budget) Human resources (Skills for manpower training)
- Ability to assess information needs of users
- Knowledge of user interaction with knowledge resources.
- Provide quality service.
- Be an information management strategist.
- Technical Skill Set like acquaintance with Database Management Systems, Networking, Web Page Development, Content Management, Operating systems, World processing, Graphics, Spread sheet & Presentations.
- Efficiency in handling Library software packages, Digital Library Tools etc.
- Ability to develop specialized information products for use inside and outside of organization

7.2 Personal Competencies

- Be resourceful, adoptive, flexible and resistant.

- Posses excellent communication skills, constantly update personal knowledge base by keeping in touch with the latest development
- Create awareness among the users, make them accept the changes
- Commitment to share knowledge and service excellence
- Ability to face challenges and to see new opportunities both inside and outside library.
- Flexibility and positive attitude in time of continuing change.

8. CONCLUSION

The role of librarians is continuing to evolve with the adoption of Internet and World Wide Web into the profession of librarianship. Though it is difficult to predict with certainty how active the role of librarians would be in this evolving scenario, it can be said with confidence that their services cannot be dispensed with because they have the necessary qualification and historically the first right to attend to the information needs of the seekers. As traditional custodians of information, librarians need to be aware of the implications of these changes and develop technological and managerial skills, which will enable them to make effective use of information and to meet their organizations changing information need.

As libraries plan and implement service for the future, they will need to make sure that the use of information technology is put within the grasp of all their users, through the design of systems that are easy to use, the development of effective instructional programs, or the provision of personal assistance when and where needed."

The most significant transition in the librarian's role is helping customers with conducting research over the Internet. Librarians, in future, would move from the background to the center of the organization. They would shed their traditional role as a part of support group, uninvolved in any critical functions, to a prominent position to jointly hold the reins of knowledge management with users and the technology experts. They would help steer and shape the knowledge policies, structures, processes, and systems that will nurture organizational learning. Librarians need vision, for librarians' skill in navigating through data is key to our future.

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Library and Information Professional in Digital Information Era: Some Aspects for New Era Librarian in Changing Environment

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Abstracts: The advancement of information communication technology has bought a lot of changes not only on the library and information services but also the roles and expectations of library and information professionals. Today's time is information and library information professionals will be left behind if it still insists on the old role of the traditional librarians so it is important that he should change and upgrade himself as per requirement of time. This paper discusses the various role of librarian and information professionals. Also attempt to understand what a successful relevant and dynamic library and information professionals must be in this digital information in the 21 century. The paper also focuses on the issue trends and challenges preparing new digital era library professionals.

Keywords: Role of Library Associations, Digital Information Services

1. INTRODUCTION

In the info tech age the concept of library is totally changed. Today librarian has changing into librarian. Librarians role job responsibilities, self image, motivation are effect by changing environment. Library and information professional there fore need to find a solution or a quick recipe and this will certainly not be a short terms project.

We are living in an information society where the development of information technology and telecommunication networks is accompanied by a corresponding increase in knowledge with a rapidly growing flow of information. This new digital information environment requires new skill in seeking, processing and using information. The base for individual ability to understand and use information is a qualitative, ongoing process. Learning and education are important topics in the information society and the educational situation is changing for several reasons. The role and importance of library and information professionals in this new changing environment has been strongly affected by these change.

Present time on view of digital information era the library and information professionals need to new professionals skills for better library services. Today in the literature of library and information management various trends. These current trends some how or rather will have a bearing in shaping library and information professionals in the new digital era. Some current trends in the library and information science are as follow:

1. Librarian's vital role in digital library
2. Librarians has changed as a cyber librarians
3. Today grouching of electronic and Internet resources.
4. Librarian expanded and changes in digital environment
5. Leadership skills in librarians
6. Books custodial role replace to access role

7. Library and information professionals need new management knowledge and skills
8. Advancement knowledge and skills in library and information management
9. Need strategic alliances, partnership and collaborations
10. New breeds of information professionals: Information consultants and analysis
11. Information strongly link to decision making, strategic management, competitive advantage, innovation research and development
12. Changed library function in information and knowledge based society
13. A vision towards information and knowledge rich society
14. Integrated and wide spread information communication technology application
15. Trends to develop digital contents to facilitate access
16. Information recognized as commodity information, brokerage, information entrepreneurship, fee based information
17. Time of globalization of information

2. LIBRARY & INFORMATION PROFESSIONALS AND TRADITIONAL ROLES AND SKILLS

The skills the library and information professionals need to manage the users require information. It is a new global library environment and it is one in which library and information professionals are still finding their way. However the foundation and the services and roles associated with it will help to ensure librarians survival. The core skills traditional associated with library and information professionals, which include information handling skills, training and facilitating skills, evaluation skills and concern for the customer are all skill relevant. The skills cover indexing, classification, CAS, SDI, reference services and user education all functions, which if managed by librarians will help to make the Internet an easier place to navigate.

In 21st century the endearing amount of information available to users and the ways in which it can be accessed has in theory made it easier for users to get the information they require. In this digital information environment the role of library and informational as both user educator and intermediary is prevalent in this environment.

The theory of librarianship, which include skills such as cataloguing and user education, are as explained above, as relevant in an electronic age as they are in a print based one and will continue to provide a solid base of skills.

Library & Information Professionals & New Roles & Skills

Professional skills mentioned above, the library and information professionals of the tutored must be equipped with a wide range if personal and transfelasee skills in order to manage the changing digital environment in which librarian works. Transferable skills over information technology skills are very important for LIPs. In the era of networked resources and services, management and interpersonal skills will make librarians more effective managers.

Library and information professionals within libraries are playing an increasing and vital role in dealing with information in electronic formats by creating web pages to promote their services to external customers and choosing automated library management systems. In the age of information explosion, skills in information organization are more necessary. Library and informational have a key role to

play in this era library and informational are well equipped to take intranet projects through the various stages of design and maintenance as they understand their users and their organization. Information needs and have the range of skills to manage knowledge effectively. 21-century library and information professionals should be able to manage the digital information system as this compass the overall competencies necessary to create, store, analyze, organize, retrieve and disseminate digital information in digital libraries or any type of information. In addition in the library professional many other skills are required for librarian. In digital information era the main concept of library is totally changed. So all library professional are required to possess some other skills also

- Technical skills
- Communication skills
- Managerial skills
- Leadership skills
- Good performance skills
- Motivation skills
- To work in team building skills etc.

3. IMPORTANCE OF NEW ERA LIBRARIAN & INFORMATION PROFESSIONALS

In the environment of digital information ear, the new era librarians is a technology application leader who works with other members of the information management team to design and evaluate systems for information access that meet user needs. In this 21st century, the librarians provide instruction and support where required, so that end users can make optional use of the information resources available to them. The new era librarian is capable of working in the print and electronic media and providing the best mix of information resources in the most appropriate formats for the environment.

New era librarian plays a key role in developing information policy for the organization ensuring that access to all information resources form internal records to external databases is provided in the most strategically effective and cost effective manner.

New era librarian plays important role in ensuring that contractual, legal and ethical obligations regarding information use are met.

New era librarian given organization new opportunities provided by the electronic information age. Familiarly with information market place can be key contributors to the development, marketing and use of information products.

The new era librarians are knowledge-based practitioners who use research as a foundation for their own professionals practice and who support the conduct of research though their professional associations such as Indian library associations.

When new era librarians going to research has shown that the provision of appropriate information can lead to better informed decision making the ability to proceed to the next step in a project or task, improved relations with a client; and the exploitation of new business opportunities. The right information at the right time can also benefit the organization by saving the time of highly paid employees instead poor business decisions and even direct loss of funds.

In the exploitation of information age the new era librarians are essential by responding with as sense of urgency to critical information needs they provide the information edge for the knowledge-based organization.

In addition the new era librarian require two main types of competencies in order to fulfill this key information role.

1. Professional competencies
2. Personal competencies

1. Professional competencies

Professional competencies related to the special librarians knowledge in the areas of information resources information access, technology, management and research and the ability to use these area of knowledge as a basis for providing library & information services. Major professional competencies of new era librarians:

1) Should develops and manages convenient, accessible and cost effective information services that are aligned with the strategic directions of the organization.
2) Library & information professionals provide excellent instruction and support for library and information users.
3) Librarians have specialized subject knowledge appropriate to the users.
4) Librarian assesses information needs and designs and markets value added information services and products to meet identified needs
5) Uses appropriate business and management approaches to communicate the importance of information services to senior management
6) Uses appropriate information technology to acquire, organize and disseminate information.
7) In response to the changing needs continually improves information problems
8) Professional competencies is an effective
9) Is an effective member of the senior management team and a consultant to the organization on information issues has expert knowledge of the content of information resources including the ability to critically evaluate and filter them.

2. Personal Competencies

Personal competencies represent a set of skills attitudes and values that enable librarians to work efficiently: be good communicators: focus on continuing learning throughout their careers, demonstrate the value added nature of their contributions and survive in the new word of work. Major personal competencies of new era librarian are as follow:

1) In personal competencies of new era librarian has effective communicators skills
2) Is flexible and positive in time of continuing change
3) Recognizes the value of professionals networking and solidarity
4) Have personal business and professional skills and creates new opportunities
5) In professional competencies of librarian plans prioritizes and focuses on what is critical.

When considering the roles that have been discussed and their requirement, it seems that apart from survival skill new era librarians should focus moose on effective skills and characteristics such as

1. Will power (because nothing will come easily)
2. Creative thinking

3. Self confidence
4. Innovativeness
5. Enthusiasm for life long learning and new roles

4. CONCLUSION

We can say that all these technologies are under way but not yet fully coordinated and targeted at the task of creating a digital library and information professionals. The new era librarian or digital librarian will because the guardian of digital information and will be the vehicle to preserve democratic access to information. The digital librarian role will be increasingly towards offering consultancy to the users in their efforts in providing digital reference services, electronic information service, beaching and retrieval of digitized information through web documents that span the universal digital library or the global digital library. The 21st century librarian will be an embodiment of a digital informational or digital knowledge worker, who will ensure that the digital libraries are used effectively and with ease. Digital librarian with newly acquired skills can play a meaningful and leading role in the networked information society of the millennium. The new era librarian adds values and can make libraries freely useful and user friendly.

To create and manage library collections and services, several personal characteristics plus the new skills and competencies are essential for the 21st century or new era librarian also demonstrated skills are needed for new era librarians to manage the digital information systems in the important areas of imaging, technologies, optical character recognition, markup languages, cataloguing, multimedia indexing, database management system technology, user interface design, programming and web technologies.

It is hoped we can stay focus in this fast changing environment which demand that librarians and information professionals must be someone with multi tasking abilities and competent in areas of work such as management, communication, language, public relations and others.

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Library and Information Science Research in India: A LISA Based Study

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Abstract: This paper analyses the growth and development of Library And Information Science Research literature published by Indian researchers as per *Library and Information Science Abstracts* (2000-2008). During 2000-2008 a total of 1001papers were published by the Indian researchers in the field. The average number of publications published per year was 111. The highest number of papers 206 were published in 2006. Authorship and collaboration trend was towards multi-authored papers. There were 485 collaborative papers. Guru Nanak Dev University (Dept. Lib. Inf. Sci.), Amritsar topped the list with 14 publications followed by National Institute of Science (Tech. Dev. Studies), New Delhi with 12 publications, Documentation Research And Training Centre, Bangalore with 11 publications and Bhabha Atomic Research Centre (Sci. Info. Resource Div.), Mumbai with 10 publications. The most prolific authors were: VKJ Jeevan (IGNOU, New Delhi) with 20 publications followed by BM Gupta (NISTADS, New Delhi) with 17 publications, Vijai Kumar (SIRD, BARC, Mumbai) and A Neelameghan (DRTC, Banglore) with 14 publications each, MP Satija (GNDU, Amritsar) with 13 publications, Kademani, BS (SIRD, BARC, Mumbai) with 12 publications, Rao, SS (Central Leather Research Institute, Chennai) with 12 publications, SM Dhawan (NPL, New Delhi). The most preferred journals by the LIS researchers were: *SRELS Journal of Information Management* with 115 publications, *Annals of Library and Information Studies with* 101 publications and *Information Studies* with 63 publications. The high frequency keywords were: Information Technology (93), Bibliometrics (75), Periodicals (61) and Library Technology (51).

Keywords: LIS Research, India

1. INTRODUCTION

Library and Information Science field has seen a paradigm shift in terms of subject coverage and application of information and communication technology. Librarians' responsibilities also have seen major changes from book keepers to Documentalists to information managers to knowledge managers. Over the years research in library and information science has grown many folds in variety of sub-fields. Knowledge assimilation and knowledge diffusion are visible to a great extent.

The library environment is currently undergoing rapid and dynamic changes. There is an increasing demand for processing of data and retrieval of information in the quickest possible time. The application of information systems and services is perhaps the only way to cope up with the information needs with speed, relative accuracy and reliability.

The impact of Information and Communication Technology (ICT) revolution in libraries over the last decade is tremendous and the developments in Internet technology has surpassed an individual's imagination. The Internet technology introduces both challenges and opportunities for libraries as well as information providers, database vendors and others involved in information handling. The developments in the electronic publishing have also made a great impact on the users' information management. These developments have provided us with a distribution channel that makes it cheap and easy to share information with others. Many individual researchers, research organisations, universities, government agencies, professional associations and commercial organisations have discovered that the Internet is simply a cheaper and more effective way of disseminating their information compared to print-based resources. There are also many Open Archive Initiatives (OAIs) all over the world on Library and Information Science to keep the users abreast of the developments

in the field and the current trend is moving to weblibraries. E-LIS (http://eprints.rclis.org); @RchiveSIC (http://archivesic.ccsd.cnrs.fr); LDL-Librarians' Digital Library (https://drtc.isibang.ac.in); DLIST - Digital Library of Information Science and Technology (http://dlist.sir.arizona.edu); MémSIC (http://memsic.ccsd.cnrs.fr); Caltechlib - Caltech Library System Papers and Publications etc. are some of the prominent e-print archive service providers in the filed of LIS. [Anil Kumar 2004, Prakasan 2005]

The Web has become the world's largest knowledge repository. Extracting knowledge from the Web efficiently and effectively is becoming increasingly important for various Web applications. The current Web still consists of more information than knowledge. Also, most of the Web mining activities are still in their early stages and will continue to develop as the Web evolves [Chen 2003].

Because of the critical scenario, librarianship is now at crossroads. The avalanche of document and information has posed serious problems to the traditional methods of organizing libraries and information centres. Actually, these methods are fast crumbling down. Now methods of handling documents and information have been thought out in the West and librarians in the United States are already in the dawn of the paperless society. In Japan, which has gone several steps further than the developed countries of the West, the home computer has become a normal feature. Probably, in the 21st century, there will be no need for large collections of books, nor for huge, imposing buildings to house such collections. It would also not be necessary to appoint a fleet of professional staff to look after such libraries. Everybody concerned – the librarians and the information scientists, the readers and the research workers – would have to stay at their homes and operate their computer terminals to supply the information required or to receive the information needed (Deshpande 1986).

Along with the technological and scientific advancements in the LIS field, library professionals have engaged in their research and development activities to solve the current problems and to add knowledge to the discipline itself. Countries all over the world are moving very fast with their research activities in the field. India is not an exception as many universities, technical institutions, scientific and R&D organisations are taking initiatives in research and development in LIS field. There are 16 universities in India to offer M.Phil. degree and 46 universities to offer Ph.D. in Library and Information Science. Guru Nanak Dev University, Amritsar; National Institute of Science, New Delhi; Documentation Research and Training Centre (DRTC), Bangalore; Bhabha Atomic Research Centre, Mumbai; Indian Institute of Technology, Kharagpur; Aligarh Muslim University, Aligarh; Madurai Kamaraj University, Madurai; University of Delhi, Delhi; University of Jammu, Jammu; Indira Gandhi National Open University, New Delhi; National Institute for Science Communication and Information Resources (NISCAIR), New Delhi etc. are also engaged in research in Library and Information Science.

Evaluation is a key component of any research and development activity. One well known productivity indicator is the number of publications produced by the scientists, institutions and countries. The term 'Librametry' was coined by S. R. Ranganathan on 18th September 1948 while giving remarks on the speech by Prof. Bernal, who had referred to library statistics in his lecture at the Leamington Spa, annual conference of Aslib (Aslib, 1949). The present impulse of Librametric (Ranganathan, 1969; and Subba Rao, 1993) episode restricted to the publications output phenomena only is a very narrow kaleidoscopic view indeed. In practice, any given historical account must be limited by its choice of coverage, technique of analysis and objectives. Effective use of already available knowledge is as valuable as creation of new knowledge. It's a field of library and information science professional where mathematical and statistical methods are applied to library materials and services. Taking the cue from the librametric analysis, [Pritchard 1969] coined another term 'Bibliometrics' for quantitative

and qualitative changes in different information sources. Later on, science and scientists themselves became objects of evaluation and it has evolved to a new field as 'Scientometrics'. Drastic changes have been witnessed in the modes of assessing science and scientists over the last two decades [Balaram 2008]. Such scientometric studies will provide some insight into the complex dynamics of research activity and enable the scientists, policy makers and science administrators to provide adequate facilities and proper guidance in which direction the research has to be conducted. Research publications are clearly one of the quantitative measures for the basic research activity in a country. The study of publication output in a field is a good indicator of status of research work in that field.

Bibliographic databases are representative samples of publication activity in any field of knowledge [Vijai Kumar et al. 2004]. Many bibliometric and scientometric studies have appeared in the literature to focus on the performance in various domains [Kalyane et al. 2004; Anil Kumar et al. 2007; Kademani et al. 2007; Anil Kumar et al. 2008]. This paper reports the findings of a study based on LISA databases where bibliographic details of publications are likely to occur.

2. OBJECTIVES

This study aims to highlight the recent trends in research in Library and Information Science with the aim of providing researchers, teachers, professionals, students and anyone interested with an updated view of the main spheres of research in the field and to present the growth of literature and make the quantitative assessment of library and information science research in India by way of analyzing the following aspects of research output: year-wise distribution, authorship and collaboration pattern, institution-wise publication productivity, most prolific authors, journals preferred for publications, high frequency keywords appeared in the keywords field of LISA database.

3. MATERIALS AND METHODS

Data was collected from online version of the *LISA (Library and information science Abstracts)*, produced by Cambridge Scientific Abstracts (CSA) for the period 2000 to 15th September 2008. The keyword 'India' is given as a search query anywhere in the records to retrieve the data for the study. A total of 1001 records were downloaded and analysed by using the spreadsheet application as per the objectives of the study. *LISA* database is one of the very comprehensive databases covering all aspects of Library and Information Science. LISA is an international abstracting and indexing database for library professionals and information specialists. LISA currently abstracts more than 400 periodicals from more than 68 countries and in more than 20 different languages.

4. RESULTS AND DISCUSSION

4.1 Growth of publications in Library and information science research in India

During 2000-2008 a total of 1001 papers were published in Library and information science research by Indian researchers. The average number of publications produced per year was 111.22. The highest number of publications (206) were in the year 2006 followed by 157 publications in 2007 146 publications in 2005. Figure-2 gives year-wise growth and collaboration rate. Growth of the literature was low in 2007 and 2003. An exponential growth of publications was observed during 2000-2006 which indicates that research received a major impetus during this period. The highest growth rate 47.47% was found in 2005 with 146 publications followed by 41.10% with 206

publications in 2006. The number of publications for the year 2008 did not reflect fully the complete coverage of the literature as the data was downloaded on 15 September 2008 and the study is restricted to this period.

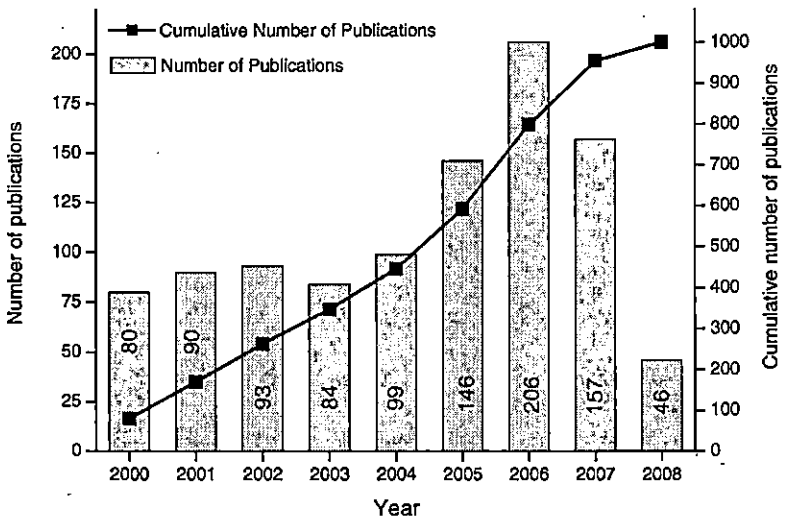


Fig.2: Year-wise publication productivity in LIS research in India

4.2 Authorship and collaboration pattern

Authorship and collaboration trend was towards single-authored publications. There were 497 (49.65%) were single-authored publications, 343 (34.27%) two-authored publications. There were 19 publications where authorship was not mentioned. Table 1 gives authorship pattern in LIS research in India.

Table1: Authorship pattern in LIS research in India

Sl #	Authorship Pattern	# Publications	Percentage
1	Authorship not mentioned	19	1.90
2	1 authored publications	497	49.65
3	2 authored publications	343	34.27
4	3 authored publications	105	10.49
5	4 authored publications	23	2.30
6	5 authored publications	6	0.60
7	6 authored publications	3	0.30
8	7 authored publications	4	0.40
9	9 authored publications	1	0.10
	Total publications	1001	100.00

4.3 Institution-wise distribution of publications

Out of 1001 records only 420 (42%) records had author affiliation mentioned in LISA database while remaining 581 (58%) records had no author affiliation information. The reason behind non availability of affiliation information for more than 58 % records may become the topic for further study. There were 214 Indian institutions involved in the research. The most productive Indian institutions were: Guru Nanak Dev University (Dept. Lib. Inf. Sci.), Amritsar with 14 publications

followed by National Institute of Science, Tech Dev Studies, New Delhi with 12 publications, Documentation Research and Training Centre, Bangalore with 11 publications and Bhabha Atomic Research Centre, Mumbai with 10 publications. Table 2 gives the list of Indian institutions contributed 2 or more publications during 2000-2008.

Table 2. Indian institutions with number of publications (e"2) in LIS research in India

Sl #	*Name of Institute*	*# Publications*
1	Guru Nanak Dev University (Dept. Lib. Inf. Sci.), Amritsar	14
2	National Institute of Science (Tech Dev Studies), New Delhi	12
3	Documentation Research and Training Centre, Bangalore	11
4	Bhabha Atomic Research Centre (Sci. Inf. Resource Div.), Mumbai	10
5	Indian Institute of Technology, Kharagpur,	9
6	Aligarh Muslim University (Dept. Lib. Inf. Sci.), Aligarh	8
7	Madurai Kamaraj University (Dept. Lib. Inf. Sci.), Madurai	8
8	University of Delhi (Dept. Lib. Inf. Sci.), Delhi	8
9	University of Jammu (Dept. Lib. Inf. Sci.), Jammu	8
10	Indira Gandhi National Open University, New Delhi	8
11	National Inst of Sci Comm and Info Res (NISCAIR), New Delhi	7
12	Karnatak University (Dept. Lib. Inf. Sci.), Dharwad	6
13	Indian Institute of Technology, Kanpur	6
14	Indian Institute of Technology (Dept. Comp. Sci. Engg.), Madras	5
15	Calicut University (Dept. Lib. Inf. Sci.), Kolkata	5
16	Karnatak University, Dharwad	5
17	Indian Institute of Science (Nat. Cent. Sci. Info.), Bangalore	5
18	Tata Institute of Social Sciences (Deemed University), Mumbai	4
19	Central Leather Research Institute, Chennai	3
20	Banaras Hindu University (Central Library), Varanasi	3
21	Manipur University (Dept. Lib. Inf. Sci.), Manipur	3
22	HKBK College of Engineering, Bangalore	3
23	Indian Institute of Technology Delhi (Dept. Biochem. Engg. Biotech.), New Delhi	2
24	University of Kerala (Dept. Comm. Journalism.), Thiruvananthapuram	2
25	Andhra University (Dept. Lib. Inf. Sci.), Visakhapatnam	2
26	Dr. Harisingh Gour University (Dept. Lib. Inf. Sci.), Sagar	2
27	Gulbarga University (Dept. Lib. Inf. Sci.), Gulbarga	2
28	Bangalore University (Dept. Lib. Inf. Sci.), Bangalore	2
29	Osmania University (Dept. Lib. Inf. Sci.), Hyderabad	2
30	Punjab University (Dept. Lib. Inf. Sci.), Chandigarh	2
31	Ministry Comm Info Tech (Egovernance Group), New Delhi	2
32	Indian Cardamom Research Institute (Spices Board), Kailasanadu	2
33	Indira Gandhi National Open University, New Delhi	2
34	Bannari Amman Inst. Tech. (Learning Resource Centre), Sathyamangalam	2
35	National Institute of Technology, Tiruchirappalli	2
36	National Physical Laboratory, New Delhi	2
37	NRLC, Lucknow	2
38	Ch. Charan Singh Univ. (Central Library), Meerut	2
39	Rajasthan Agricultural University, Jobner	2
40	Shaheed Bhagat Singh College of Engg. and Tech., Ferozpur	2
41	State Council of Educational Research and Training (SCERT), New Delhi	2
42	University of Hyderabad, Hyderabad,	2

4.4 Most prolific Indian authors

There were 1157 authors who have published 1001 publications with 1732 authorships. The most prolific Indian authors were: VKJ Jeevan (IGNOU, New Delhi) with 20 publications followed by BM Gupta (NISTADS, New Delhi) with 17 publications, Vijai Kumar (SIRD, BARC, Mumbai) and A Neelameghan (DRTC, Banglore) with 14 publications each, MP Satija (GNDU, Amritsar) with 13 publications, BS Kademani (SIRD, BARC, Mumbai) and Rao, SS (Central Leather Research Institute, Chennai) with 12 publications each, SM Dhawan (NPL, New Delhi) with 11 publications. Table 3 gives the list of most prolific Indian authors.

Table 3. The most prolific Indian authors with number of publications (e"5) in LIS research in India

Sl #	*Name of Author*	*# publications*
1	Jeevan, VKJ	20
2	Gupta, BM	17
3	Vijai Kumar	14
4	Neelameghan, A	14
5	Satija, MP	13
6	Kademani, BS	12
7	Rao, SS	12
8	Dhawan, SM	11
9	Anil Kumar	10
10	Sagar, Anil	10
11	Chandrakar, R	9
12	Garg, KC	9
13	Kannappanavar, BU	9
14	Murthy, TAV	9
15	Sahay, S	9
16	Sen, BK	9
17	Malhan, IV	8
18	Surwase, Ganesh	8
19	Biradar, BS	7
20	Ghosh, Maitrayee	7
21	Maheswarappa, BS	7
22	Panda, KC	7

Sl #	*Name of Author*	*# publications*
23	Senthilkumaran, P	7
24	Gupta, VK	6
25	Kaula, PN	6
26	Kaur, Amritpal	6
27	Kumar, Suresh	6
28	Kumbar, M	6
29	Nikam, K	6
30	Rao, S	6
31	Anuradha, KT	5
32	Gaderao, CR	5
33	Gupta, DK	5
34	Kalyane, VL	5
35	Karisiddappa, CR	5
36	Kumar, S	5
37	Kumbar, BD	5
38	Lalit Mohan	5
39	Murthy, Siva Ram	5
40	Sangam, SL	5
41	Singh, Neena	5
42	Singh, SP	5
43	Tadasad, PG	5
44	Vijayakumar, M	5

4.5 Preference of journals for publication

The publications in library and information science research were spread over 205 journals. The leading journals preferred by the scientists were: SRELS Journal of Information Management with 115 publications followed by Annals of Library and Information Studies with 101 publications, Information Studies with 63 publications. Table 4 gives the list of the top journals preferred by Indian authors to LIS research.

Table 4: List of journals with number of publications (e"5) in LIS research in India

Sl #	*Name of Source*	*# Publications*
1	SRELS Journal of Information Management	115
2	Annals of Library and Information Studies	101
3	Information Studies	63
4	DESIDOC Bulletin of Information Technology	40
5	Journal of Library and Information Science	39
6	Scientometrics	39
7	International Information and Library Review	34
8	Herald of Library Science	31
9	Electronic Library	20
10	Library Review	20
11	Malaysian Journal of Library & Information Science	17
12	Library Philosophy and Practice	14
13	Library Hi Tech News	13
14	Annals of Library Science and Documentation	11
15	Information Society	11
16	COLLNET Journal of Scientometrics and Information Science	10
17	IASLIC Bulletin	10
18	Information Technology for Development	10
19	International Information Communication & Education	9
20	Information Development	8
21	The International Information & Library Review	8
22	Bookbird	7
23	Science and Technology Libraries	7
24	Webology	7
25	Bookseller	6
26	Computer Networks	6
27	The Electronic Journal of Academic and Special Librarianship	6
28	Information Today	6
29	INSPEL	6
30	International Journal of Information Management	6
31	Knowledge Organization	6
32	Knowledge-Based Systems	6
33	Program	6
34	Telecommunications Policy	6
35	World Patent Information	6
36	Managing Information	5
37	New Scientist	5
38	Online Information Review	5
39	Quarterly Bulletin of The National Library of South Africa	5

4.6 Keyword analysis

Keywords are one of the best bibliometric indicators to understand and grasp instantaneously the thought content of the publications and to find out the growth of the subject field. By analyzing the keywords appeared either in the title or assigned by the indexer or the author himself help in knowing in which direction the knowledge grows. The high frequency keywords will enable us to understand what are all the aspects that have been studied. In the current study the keywords appeared in the 'Keywords' field of *LISA* database were analysed for the purpose. The high frequency keywords were: Information Technology (93), Bibliometrics (75), Periodicals (61) and Library Technology (51). Table 5 gives the list of high frequency keywords.

Table 5. List of keywords with frequency (e"5) in LIS research in India

Sl #	Keywords	Frequency
1	India	465
2	information technology	93
3	bibliometrics	75
4	periodicals	61
5	library technology	51
6	scientometrics	48
7	surveys	42
8	digital libraries	41
9	libraries	41
10	electronic media	38
11	university libraries	38
12	communications technology	36
13	Internet	36
14	library management	35
15	research	34
16	library materials	32
17	librarianship	31
18	science and technology	31
19	articles	28
20	world wide web	28
21	cooperation	27
22	rural areas	27
23	users behavior	27
24	digitization	26
25	library and information science	26
26	online information retrieval	26
27	user surveys	26
28	information work	25
29	networks	25
30	public libraries	25
31	book review abstracts	24
32	Developing libraries	24
33	knowledge management	24
34	citation analysis	23

Sl #	Keywords	Frequency
35	software	23
36	information communication	22
37	information centres	21
38	publishing	21
39	use studies	21
40	academic libraries	20
41	college libraries	19
42	user services	17
43	computer applications	16
44	information services	16
45	library consortia	16
46	preservation	16
47	scholarly publishing	16
48	agriculture	15
49	history	15
50	access to information	14
51	electronic periodicals	14
52	economic aspects	13
53	electronic publishing	13
54	evaluation	13
55	librarians	13
56	scientists	13
57	archives	12
58	computers	12
59	distance learning	12
60	medicine	12
61	online databases	12
62	professional education	12
63	technological university libraries	12
64	web sites	12
65	government information	11
66	information industry	11
67	information seeking behaviour	11
68	international conferences	11

Sl #	Keywords	Frequency
69	law	11
70	patents	11
71	scholarly publications	11
72	science	11
73	students	11
74	contracting out	10
75	acquisitions	9
76	authors	9
77	collection development	9
78	comparative studies	9
79	curricula	9
80	databases	9
81	Indian materials	9
82	information literacy	9
83	information professionals	9
84	library staff	9
85	searching	9
86	social aspects	9
87	social sciences	9
88	theses	9
89	UK	9
90	USA	9
91	biographies	8
92	books	8
93	case studies	8
94	economic development	8
95	Indian Institute of Technology	8
96	information society concept	8
97	research and development	8
98	research libraries	8
99	service quality	8
100	special libraries	8
101	Asia	7
102	author productivity	7
103	business	7
104	children's books	7
105	collaboration	7
106	conferences	7
107	globalization	7
108	marketing	7
109	medical libraries	7
110	national policies	7
111	organizations	7
112	performance measures	7
113	universities	7

Sl #	Keywords	Frequency
114	user training	7
115	automation	6
116	bibliographic databases	6
117	chemistry	6
118	education	6
119	electronic commerce	6
120	engineering	6
121	finance	6
122	health care	6
123	higher education	6
124	knowledge organization	6
125	leadership	6
126	manuscripts	6
127	newspapers	6
128	virtual libraries	6
129	wireless communications	6
130	Bangalore	5
131	business information	5
132	cataloguing	5
133	citation indexes	5
134	co authorship	5
135	companies	5
136	data mining	5
137	electronic money	5
138	influence	5
139	information sources	5
140	information systems	5
141	institutional repositories	5
142	intellectual property	5
143	library and information science periodicals	5
144	management techniques	5
145	medical informatics	5
146	mobile communications	5
147	online catalogues	5
148	People's Republic of China	5
149	portals	5
150	professional development	5
151	reading	5
152	research organizations	5
153	restoration	5
154	science citation index	5
155	software engineering	5
156	telecommunications	5

4.7 Top Websites Covered in LIS research in India

The web-resources is becoming an important area for bibliometrics, scientometrics and informetrics studies. The term 'Webometrics' was first coined by Almind and Ingwersen in 1997 [Almind et al. 1997]. [Björneborn et al. 2008] have defined webometrics as *"the study of the quantitative aspects of the construction and use of information resources, structures and technologies on the WWW drawing on bibliometric and informetric approaches"*. [Thelwall et al. 2008] have reviewed the literature on webometrics. There are a few studies related to web-resources in databases [Kademani et al. 2007; Anil Kumar et al. 2008]. LISA has covered 230 (58%) websites during 2000-2008 Out of 1001 publications of Library and Information Science Research in India. Table–6 provides the websites which have published more than 4 publications. The top websites were http:// www.emeraldinsight.com with 48 publications followed by http://www.elsevier.com with 31 publications, http://www.niscair.res.in/ with 31 publications and http://www.webpages.uidaho.edu with 14 publications.

Table 6: Top websites covered by LISA database with ≥4 publications LIS research in India

Sr. No.	URL	No. of papers
1.	http://www.emeraldinsight.com	48
2.	http://www.elsevier.com	31
3.	http://www.niscair.res.in/	31
4.	http://www.webpages.uidaho.edu/~mbolin/lpp.htm	14
5.	http://www.springeronline.com	13
6.	http://www.sagepub.co.uk	7
7.	http://umweb.um.edu.my/umpress/index.htm	6
8.	http://www.interscience.wiley.com	6
9.	http://www.tandf.co.uk/journals	6
10.	http://www.idea-group.com	5
11.	http://www.managinginformation.com	5
12.	http://www.saur.de	5
13.	http://www.ulrichsweb.com/	4

5. CONCLUSION

This paper analysed the contributions (1001) by the Indian researchers in the field of library and information science covered in *LISA* database during (2000-2008) last nine years. The average number of publications produced per year was 111.22. The highest number of publications (206) were in the year 2006 followed by 157 publications in 2007 146 publications in 2005. Growth of the literature was low in 2007 and 2003. An exponential growth of publications was observed during 2000-2006 which indicates that research received a major impetus during this period. The highest growth rate 47.47% was found in 2005 with 146 publications followed by 41.10% with 206 publications in 2006. A detailed citation analysis of these publications may give interesting insights into the dynamics of this field.

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Quality Faculty for Excellence in Library and Information Science Education in Pakistan

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Abstract: This paper looks at the 'quality faculty' as a critical factor in achieving excellence in Library and Information Science education in Pakistan. It discusses the essential characteristics of quality faculty, their selection, inbreeding, preparation, development, and enablement aiming at empowering them to be more effective teachers and researchers. The material presented is derived from earlier studies, websites of selected American universities, and a questionnaire from six Pakistani universities. The quality of LIS faculty in Pakistan is generally low in terms of academic qualifications and research output. There is extensive inbreeding and lack of mentoring and continuous professional development. This was an exploratory study which should lead to an intensive analysis of the current faulty situation. The existing situation in Pakistan should be examined in-depth to determine short-term and long-term goals and prepare action-based programmes to develop the faculty. The paper deals with some aspects of higher education faculty that are rarely discussed in developing countries. It will, hopefully, generate meaningful discussion of these issues to improve the quality of faculty.

Keywords: Library and Information Science Education; Quality Faculty; Faculty selection; Inbreeding; Faculty development; Mentoring.

1. INTRODUCTION

The political, economic and industrial developments, immediately following the World War II, created an unprecedented demand for trained manpower on a scale which necessitated the quick multiplication of educational institutions worldwide. Later on, ICT developments, following the 1950s, accelerated that demand much further. However, the resources needed to sustain the quality of education could not be made available on a short-term basis to meet the rapidly increasing demand for trained manpower. As a result, quality manpower through quality education has been of overriding concern worldwide during the past 50 years. Higher education, in particular, has been facing a real crisis especially in developing countries that lacked long-standing high quality universities and mainly depended on newly created and fast growing institutions supported with limited financial resources.

Many papers have been published indicating the deterioration in higher education in the advanced countries and sounding an alarm for their competitiveness in the international arena (AAC, 1985; Gibbs, 1995; Moodie, 1988). Similar alarms have been sounded in many developing countries (Cannon and Widodo, 1994; Fourie and Alt, 2000; Gupta, 2002; Odabasi, 2005). It has been observed that the quality of education in the Middle East and North Africa is low because of the inefficiency of managing the resources allocated to it (Heyneman, 1997). Commenting on the situation in India and the efforts of its University Grants Commission to revive excellence in higher education, Gupta (2002) wrote: Teachers in general do not have love and devotion for studies. They lack commitment and dedication to their noble profession. Any attempt to make them accountable has met with opposition. ... The second reason ... has been the appointment of inferior teachers on the faculty who ... are not the best amongst the available ones. ... The third reason for the deterioration in higher education has been in making it 'mass education' (p. 1433-1434). The situation in most of the developing countries would be similar. The areas of major concern in excellence in higher education have been: the faculty, the curriculum, the learning resources, and the students. Each of these areas needs to be developed, cared for, and brought to a level where their synergy results in high quality education. Teachers, at any level of education, without doubt, are the critical resource. They are the ones who develop the

curriculum, learning resources, and students. It can be safely said that teachers are the driving force behind all educational institutions and assisting them to be as effective and productive as possible will make each institution more productive.

It has been estimated that about 80 percent of the operating budget of higher education institutions is spent on human resources (FDI, 2007). It will certainly be a disaster if this large input makes a low quality contribution to the national educational output. With that perspective in mind, higher education leaders worldwide have begun to appreciate the importance of investing in faculty development, especially in the younger faculty, as a means of augmenting the future strength and vitality of their institutions. A number of authors have criticized the status of LIS education in Pakistan. Khurshid (1992), while discussing the condition of the LIS programmes in Pakistan, concluded that "The establishment of the recently founded library schools in the country has been without meeting the minimum standards. It is hard to justify the existence of some of the programmes. We need to evolve an effective mechanism of check and balance to avoid any further expansion without having resorted to an objective review and planning" (p. 27-28). Rehman (1992, 1993), sharing Khurshid's concern, considers the existing situation in quite a dismal state and is very critical of the quality of the present faculty in terms of their qualification, field experience, and research and publications output. Amin (1992) remarked that in "terms of total faculty strength, the situation appears to be quite encouraging. But the level of capability of the faculty members presents a somewhat dismal picture. Indeed it is an area of serious concern. The faculty members do not have the requisite academic and professional credentials" (p. 62).

2. QUALITY FACULTY

Quality, according to Burford and Cooper (2000) "is judged in terms of the extent to which a product or service meets its stated purpose" (p. 201). The issue of 'quality faculty' is very complex and also a sensitive one. It can be deliberated upon in the context of national policy which will affect it tremendously. It is also affected by the institutional context. The scope of this paper does not permit us to explore these vital areas. The 'individual' as a faculty member will be our focus. The discussion will be presented as an academic discourse with a focus on the discipline of Library and Information Science (LIS) in the Pakistani context.

Six Pakistani universities (excepting the Open University) that offer masters, with some of these having doctoral studies also, in LIS have altogether 42 faculty members. These consist of only two (4.8%) professors, no associate professors, 22 (52.4%) assistant professors, and 18 (42.9%) lecturers. Only five (11.9%) of them possess post-master degrees (four have doctorates and one an M. Phil.) whereas 37 (88.1%) have just a master's degree. It is surprising that several of these universities offer doctoral degrees, based on taught courses and research, with very little or no senior faculty to teach and supervise doctoral students. This academically unhealthy situation must be a good reason for the university administration to worry about and engage in improving the current situation.

The discussion below will concentrate on the following areas:

1. Who is a 'good professor'?
2. Selection of a 'good professor'
3. Preparation of a 'good professor'
4. Development of a 'good professor'
5. Enablement of a 'good professor'

These topics will be discussed in relation to the situation of LIS faculty in Pakistan. It will derive some material from available literature and research done elsewhere. The data about Pakistan was collected through a short questionnaire and personal contacts with the faculty during a conference held in 2007 (PLA, 2007). The data about inbreeding in American universities was obtained from the website of each institution.

2.1 University Professor As A 'Good Professor'

A concern for a 'good professor' has been there since long. Writing about this issue very early, Donnelly (1951) said that the teaching profession had not "developed generally agreed upon criteria for the measurement of the worth of a college teacher" (p. 304). Formal evaluations by students of class performance of the faculty in some American universities became the norm during the 1960s. Such evaluations were used by students to make decisions for course selection and were placed in the personal files of the concerned faculty to be used for managerial decisions. At the same time, a number of scholars have tried, through research, to identify the characteristics of a 'good professor' (Corlett, 2005; Ebro, 1977; Mina, 2002; Miron, 1985; Miron & Segal, 1978; Sheffield, 1974).

Mina (2002) defines 'a good class' as:

1. A 'good' instructor with the right attitude
2. 'Good' students with the right attitude
3. A good synergy for the whole class

Mina's prescription can be considered as an ideal which seems to be elusive and difficult to achieve. However, there is a need to empirically define the characteristics of a 'good professor'. A perusal of published literature indicates that more research has been done on identifying the essential characteristics of a good school teacher (Minor, 2002; Polk, 2006) than on the same theme related to a good university professor. Miron (1985) and Miron and Segal (1978) studied the characteristics of a 'good professor' based on the perceptions held by instructors (N=51) and undergraduate students (N=589) at Tel Aviv University, Israel, using a set of 15 pre-identified characteristics.

A comparative ranking of these characteristics as perceived by both the groups is given in Table 1.

Table 1: Characteristics of a 'Good Professor' as Perceived by Instructors and Students

Characteristic	Ranked by Faculty	Ranked by Students
Ability to stimulate intellectual curiosity	1	5
Develops thought processes	2	4
Preparation and organization of lessons	3	2
Attention to student feedback	4	8
Develops motivation	5	6
Research ability	6	15
Knowledge of material	7	9
Interesting presentation of material	8	1
Lucid expression of ideas	9	3
Friendly approach	10	13
Willingness to help	11	11
Fluency of speech	12	7
Sense of humor	13	10
External appearance	14	14
Flexibility	15	12

Source: Miron (1985) and Miron and Segal (1978).

The rankings of the characteristics of a 'good professor' by both the groups vary quite a bit. There is an exact match for only two characteristics which are 'Willingness to help' and 'External appearance'. However, it is interesting to note that the top nine characteristics selected by the instructors are also those identified by the students, with varying ranks, except one. The undergraduate students give 'Research ability' of the teacher the lowest ranking (i. e. 15 out of 15) whereas the instructors put it at the sixth place. One must remember that these students were undergraduates and were mainly interested in the teaching competence rather than the 'research ability' of their instructors. It is reasonable to assume that the graduate students would have given this ability a higher ranking.

Sheffield (1974) enumerates ten characteristics of effective teachers cited in the literature most often. These are: 1. master of his/her subject, competent; 2. lectures well prepared, orderly; 3. subject related to life, practical; 4. students' questions and opinions encouraged; 5. enthusiastic about his/her subject; 6. approachable, friendly, available; 7. concerned for students' progress, etc.; 8. has a sense of humor; amusing; 9. warm, kind, sympathetic; and 10. teaching aids used effectively. Zhang (2004), after reviewing the earlier literature, lists six essential dimensions of an effective teacher as perceived by students. These are: "1. academic qualification and scholarship; 2. preparedness and subject knowledge; 3. personality trait and personal style; 4. connectedness with students; 5. motivation and enthusiasm; and 6. classroom operation" (p. 238-240). Whatever the set of domains and traits essential for a 'good professor', how do we make sure that the individuals who join the profession possess those traits?

2.2 Selection of a 'Good Professor'

The selection of faculty members in many developing countries is done simply on the basis of advertisements of vacant positions followed by brief interviews of applicants. Even if the candidates are selected on merit, without extraneous factors weighing on the process, no exercise is conducted to know whether the applicants possess the essential characteristics of a 'good professor'. Once the freshly employed individuals complete their probation period, which is generally one year, they gain permanent status and can not be removed from service. What will happen if these individuals start displaying, immediately after they gain a permanent status, traits counter to those that are essential for a 'good professor'? That is why some countries have used, or are considering using, contractual employment in the beginning (Gupta, 2002) and adopting the tenure system as practiced in the United States.

Can the selection process be divorced from the vacancy/advertisement system and be made a part of the graduate education? American universities realized this problem and tried to improve their selection process. Several American studies discovered that "graduate students show a strong desire for more information about potential careers, greater attention to teaching, better mentoring, and closer relationship between doctoral preparation and the realities of faculty work" (Gaff et al., 2003). As a result of this realization, Preparing Future Faculty (PFF) programme, with a new vision and structured institutional participation, was launched in the U. S. during 1993. Many universities and professional societies joined together to prepare future professors. Several ten-year PFF evaluative reports, pointing to positive results, have since been published (Gaff et al., 2003; Pruitt-Logan et al., 2002).

Another problem that universities have faced, many a time without realizing it, is that of intensive inbreeding which is considered an unhealthy practice. When an institution recruits its new faculty from its own graduates it is indulging in inbreeding. It has been found that inbreeding strengthens localized views, stifles creativity, magnifies the negative characteristics of the institution, and does not provide

an opportunity to bring in diverse experience and positive points from outside sources (Eells and Cleveland, 1999; Rocca, 2007). Therefore, top universities, as a matter of policy, do not like being inbred and try to avoid it as much as possible. The current status of the level of inbreeding in the top 10 American LIS programmes is presented in Table 2.

Table 2: Inbreeding in the Top Ten American LIS Programmes

University	Total Faculty	Own Graduates (%)	External Recruitment (%)	Information Not Available (%)
Illinois at Urbana-Champaign	18	4 (22.2)	14 (77.8)	0
North Carolina at Chapel Hill	24	1 (4.2)	23 (95.8)	0
Syracuse University	29	3 (10.3)	17 (58.6)	9 (31.0)
University of Washington	39	4 (10.3)	26 (66.7)	9 (23.0)
University of Michigan	41	4 (9.8)	37 (90.2)	0
Rutgers – The State University	22	1 (4.5)	8 (36.4)	13 (59.1)
Indiana University	21	5 (23.8)	16 (76.2)	0
University of Pittsburgh (LIS only)	12	3 (25.0)	9 (75.0)	0
University of Texas at Austin	19	2 (10.5)	17 (89.5)	0
Florida State University	19	2 (10.5)	16 (84.2)	1 (5.3)
All 10 universities	244	29 (11.9)	183 (75.0)	32 (13.1)

Source: Information obtained from the website of each university. Positions designated as Research, Practice, Affiliate, Adjunct, and Emeritus were not included.

The incidence of inbreeding in these 10 universities varies from as low as 4.2 percent to a maximum of 25 percent. The level of external recruitment is extensive as high as 95.8 percent. The figures for Rutgers seem to be low due to the lack of academic qualification information for almost 60 percent of the faculty. If Rutgers, due to lacking information, is excluded the lowest figure for external recruitment is 58.6 percent. Inbreeding in all ten top universities combined together is 11.9 percent as compared to external recruitment of 75.0 percent.

What is the level of inbreeding in Pakistani universities? Figures for six universities that offer master's programmes in LIS, with most also offering doctorates, are given in Table 3.

Table 3: Inbreeding in LIS Programmes in Pakistan

University	Total Faculty	Own Master's (%)	Other Local Master's (%)	M.Phil.+	Own Ph D.+	Foreign Ph. D.+
Islamia University, Bahawalpur	10*	5(50.0)	5(50.0)	1	0	1
University of Baluchistan	7	7(100)	0	0	0	0
University of Karachi	9	9(100)	0	0	1	0
University of Peshawar	6	5(83.3)	1(16.7)	0	0	0
University of Sind	5*	5(100)	0	0	1	0
University of the Punjab	5	5(100)	0	0	2	0
All universities	42	36(85.7)	6(14.3)	1	4(80.0)	1(20.0)

* Retired faculty members were excluded.
\+ These faculty members were also counted in the master's degrees.

Inbreeding in Pakistani universities is very high, reaching 100 percent in four of the six universities. It is interesting to note that all 42 faculty members obtained their master's degrees from local universities, mostly their own. Out of the five faculty members who hold doctorates, four obtained

these from their own university. Only one has a doctorate from a foreign university. Five of the ten faculty members at the Islamia University acquired their master's degrees from other local universities. Only one of the six faculty members at the University of Peshawar has his master's degree from another local university. Seven faculty members are working on their doctorates, all in their own universities.

This situation, which is not academically sound, seems to be mainly caused by the limited availability of foreign scholarships, formerly allowing promotion to higher academic ranks based on master's degrees, and the lack of geographic mobility caused by the use of provincial domicile in the recruitment policy. Lately, promotion to higher ranks without a doctorate has been stopped and the Higher Education Commission has started encouraging and assisting local graduates to compete for its scholarships to acquire doctoral degrees from developed countries.

2.3 Preparation of a 'Good Professor'

Most of the new university faculty is recruited from fresh graduates. Universities, in general, ignore the post-induction phase of faculty preparation through a formal course of study. School teachers in most countries go through a standardized formal training programme, are then certified to teach, and have to take refresher courses on a regular basis. Post-secondary teachers are neither formally trained in teaching related subjects nor are required to get certified. Fresh faculty members are left to sink or swim entirely on their own. They learn teaching skills indirectly by copying their teachers or by trial and error. The American PFF project (Gaff et al., 2003; Pruitt-Logan et al., 2002), the Carnegie Foundation for the Advancement of Teaching (Golde and Walker, 2007), and the Council of Australian Deans and Directors of Graduate Studies (2006) cover a lot of essential ground with regard to the improvement of doctoral programmes to produce quality faculty.

The universities in developing countries lack resources of those of the West. They need to develop a one-year post-induction training program for all new recruits. Such a programme could include the following areas of study:

a. Curriculum design

b. Teaching methodology

c. Preparation of teaching materials

d. Student evaluation, and

e. Educational management

Fresh graduates who are employed as faculty members should only be allowed to teach after successfully completing this training. Such a programme could become a requirement for certification of post-secondary teachers.

It is suggested that each university should establish a well-designed, and with reasonable resources, a Centre for Faculty Development that prepares its activities focusing on the growth of younger faculty members.

2.4 Development of a 'Good Professor'

2.4.a Continuous Professional Development (CPD)

It is considered crucial for any practitioner to remain up to date in the knowledge and practice of his profession. This area has also received very little attention from university administration. It is only recently that programmes are being developed to improve quality of teaching through CPD (Burford and Cooper, 2000; ECU, 2005; FDI, 2007; SIT, 1995). Many American universities have started establishing strong faculty development centres that conduct CPD activities on a regular basis. One

question that needs to be resolved is whether CPD should be voluntary or mandatory. School teachers are required to go through refresher courses at regular intervals. Some professions make it obligatory for their members to attend certain number of courses each year to retain their practicing licenses.

In addition to some other activities, CPD focuses on the following areas:

(1) Faculty member as a teacher:

The training activities in this area focus on teaching covering class organization, in-class presentation skills, teacher-student interaction (advising, tutoring, discipline, politics and administration), and evaluation of students.

(2) Faculty member as a scholar and professional:

This area focuses on career planning, developing scholarly skills (proposal writing for research funding, collaboration in research, and publishing), and team, committee and administrative work.

(3) Faculty member as a person:

An emphasis is now being placed on personal wellness management, interpersonal skills, stress and time management, and similar areas.

Whatever CPD activities are carried out it is imperative that faculty development must be institutionalized.

2.4.b Formal Mentoring

Fresh faculty recruits always find their new teaching and research roles stressful in the beginning and need time to adjust. Some of the most important sources of stress during their first year include feelings of loneliness, isolation, lack of social and intellectual stimulation, and insufficient support from senior faculty members (Sorcinelli, 1994). A reasonable support from the university administration and senior faculty is critical for faculty development and the future success and vitality of the institution. One source of such support is formal mentoring attachments, a junior faculty member attached to a senior one. During the past 10 years, mentoring, both internal and external, has become widespread, even linking educational institutions and industry. MentorNet (2007), which was established in 1997 as a non-profit network, to provide "highly motivated protégés from many of the world's top colleges and universities with positive, one-to-one, email-based mentoring relationships with members from industry, government, and higher education", has been able to create 18,379 matches in 50 U. S. states and 55 countries world-wide. It is imperative that organized mentoring arrangements at least at the individual institutional level, to begin with, must be made focusing on teaching, research, and community participation.

2.5 Enablement of a 'Good Professor'

Empowerment of the faculty is a new wave dominating the academic discourse. This term, as such, has a negative connotation. It raises questions whether faculty members are deprived of power, whether power will be given to them by an external source, and, if conferred or acquired, it will be used against someone else. A more appropriate concept, and one with a positive connotation, is 'enablement', meaning 'the act of enabling, or the state of being enabled'. The basic idea behind empowerment is 'enabling' the teacher to perform his role more effectively and powerfully. It focuses on reorienting the faculty attitude to become more effective teachers and researchers, to redefine their work roles including participation in decision making, to provide opportunities for learning or enhancing essential skills, and to develop competencies in the application of relevant information and communication technologies in teaching and learning.

There are wider areas within the universities that interact with and affect the role of the teacher. Such interactions must be made more effective and humane. There needs to be a focus on the overall improvement of the institution, making its structure and management more responsive, effective and efficient in supporting teaching, research and learning.

3. CONCLUSION

If the educational planners and managers in Pakistan are serious about excellence in education, general or professional, the country must learn from the experience of those that have achieved, or, are on the way to achieve this goal. First, there is a need to realistically and objectively determine where we stand on the scale of excellence in education, if such a scale was available. And then determine, again realistically and objectively, the short-term and long-term goals that we wish to achieve so that our new generations have access to excellent education. The faculty must be the top priority when goals are determined.

There is a need to conduct a thorough study of the faculty at each university with regard to their qualifications, ranks, teaching skills, ICT skills, and developmental needs. Each university should create a strong Centre for Faculty Development with reasonable resources at its disposal to develop policies and implement programmes, especially focusing on the younger faculty. Each university should prepare a strategic faculty development plan including tangible objectives and outcomes. Until a viable cadre of senior faculty is available, younger teachers should be sent to advanced countries for their doctoral degrees. This practice should, in due course of time, result in limited inbreeding in the future and improve quality of education. There is also a need to seriously review the current doctoral studies which should be offered only when adequate senior faculty and other resources are available.

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Role of LIS Professionals in Internet Age

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Abstract: This paper deal with the various aspects related with the role of LIS professional in Internet age. Role of LIS professional will be increasingly towards offering consultancy to the users in their efforts in providing electronic reference services and electronic information services, navigating, searching and retrieval of electronic information through web documents. This article also highlights the role and skills of the LIS professionals. Due to the recent development of ICT environment the growing digital collection, distributing learning and multi and extra disciplinary research environment and the changing behavior of digital users.

Keywords: ICT Environment, Digital Era, LIS Professional, IPR, Electronic resources.

1. INTRODUCTION

Due to the knowledge explosion and the advancement of information communication technology the concept of libraries shifted from traditional to digital. Presently we are living in digital environment. Application of computer and communication methods, online access to e-book, e-journals, e-knowledge banks, PDF documents, teletext, teleconferences, bulletin boards, etc. have been the revolutionary development in the last few decades that have brought a great change in storing and handling of information. Libraries are today termed as digital libraries and hybrid libraries.

The role of the LIS professional is absolutely crucial in the new digital environment, where there are great quantities of information but finding the quality in the huge haystack is a difficult task. To manage the digital library effectively the information manager should have the knowledge in the field of computer and networking, content manager and information analysis, internet surfing technique, digital resources, websites and organization of data etc.

2. DIGITAL LIBRARY

The concept of digital library is outcomes of the popular use of information communication technology. According to Wiederhold " a digital library is popularly viewed as an electronic version of a library where storage is in digital form, allowing direct communication to obtain material and copying it from a master version.",[1] " Digital library is a combined technology and information resources to allow to remote access, breaking down the physical barrier between resources"[2]. In the other word of Winensky. "The digital library will be a collection of distributed information services, produces will make it available and consumers will find it through the automated agents"[3]. Digital library is a user- friendly interface and provides on institute means of presenting information, scanning the volumes insides the library itself and data getting from sources using at office and home. The digital library as it is called is an informative transregional or even transmittal space for effectively keeping, disseminating information by means of the modern information communication technology. According to Arms " A digital library is a managed collection of information with associated services by which the information is stored in digital formats and accessible over a network."[4]

We are living in the age of information explosion and information communication technology, revolution leading to the emergence of ICT and knowledge era. Use of ICT for information process, storage and communication technology have revolutionized the role of worldwide libraries in disseminating information services to their users. As a result libraries are facing new challenges. Users are no longer satisfied with old printed materials. Users want information delivery in digital from without any time consuming.

3. ROLE OF DIGITAL LIBRARY IN INTERNET ERA

3.1 Preservation

Digital preservation raises challenges of different nature, which are added to the problems of preserving traditional format materials. Digital preservation included everything from electronic publication on CD-ROM to online databases and collection of experimental databases in digital format maintains the ability to display retrieve and use digital collections in the face of rapidly changing technological and organizational infrastructure and elements [5]. Digital information can be accessible only through combinations of hardware and software. Digital preservation is the ability to keep digital documents and files available for time periods than can transcend technological advances without concern for alteration or loss of readability.

3.2 Data Conversion

The primary method of develop digital collection is digitization. Digitization refers to the conversion of an item-be it printed text into digital format. Hence data conventional to electronic format is an important and challenging task for conventional libraries.

3.3 Upgrade Current Technical Architectures

The Libraries will need to enhance and upgrade current technical architectures to accommodate digital materials. Components of the architecture will be required such as high-speed networks and high-speed Internet connections, full text search engines to index and provide access to resources, relational databases that support a variety of digital formats. Access to the local resources that are part of the libraries collection. Digital access to local and remote resources from off-site locations. One of the major issues in creating digital libraries will be the building of digital resources which is largely depends on the nature of content and quality of digital resources.

3.4 Copyright and Intellectual Property Rights (IPR)

The IPR issues on digital contents are much more complex than for printed materials. Digital objects are accessed by multiple users and can be easily copied. IPR issues in digital environment have implications not only digital contents but also to any related software. Simply refreshing digital materials onto another medium, encapsulating content and software for emulation, or migrating content to new hardware and software, may lead to infringement of IPR unless statutory exemptions exist or specific permissions have been obtained from the right holders [6].

4. ROLE OF LIS PROFESSIONAL & SKILL REQUIREMENT

In the present information and communication technological era the professionals have to change themselves as the information profession is being changed. Today information has become a major economic commodity. The LIS professional is responsible for locating, acquiring, disseminating and

tracking information resources of many types. LIS professional and libraries and information centers (LIC), play a very crucial role in the education of people for effective and efficient information use by teaching them information skills at all levels of education to enables to be informed citizens of country. LIS professional are key personnel in the implementations of resource based programs. LIS professional need to play a crucial role in the education process by making people aware of a need and motivating the use of information a new knowledge. For successful implementation of digital library it is essential that LIS professional are well trained and possess requisite knowledge and skills in this respect.

4.1 As a Collection Developer

LIS professional supports a specific subject area by managing and digital collections by providing teaching support and Internet based materials development.

4.2 As a Teacher

Awareness of Information literacy has been the main role of LIS professional in the society to mould into information rich society. LIS Professional skill in the area of information communication technology. Develop the educational model, and teaching techniques are important in their new re-educational role. Teaching skills are key in today's environment where LIS professionals are taking an active role in forming partnership with faculty in achieving key information literacy outcomes and therefore the librarians are recognized as teachers [7] LIS professional are play important role as a teacher they conducted a user educational programme for new user in the library.

4.3 As a Content Manager

The LIS professional can play a crucial role in easy accessing of computer indexing, abstracts, full-text database video recording in electronic formats. As a content manager LIS professional required to organized and disseminate digital information provide digital and electronic reference services, provide global access and retrieval of digital content, maintain Internet, Intranet, Managing new inputs, user access control, etc. handle the digital storage and digital preservation. To develop digital and online database systems and establish network technology.

4.4 As a Leader

A fundamental role of a LIS professional in digital environment is to act as an intermediary who brings together users and information. LIS professional to play active role as a leaders for effective change management in achieving results. Kouze and Pozner (2000) summarize them as essential practices such as; challenge the process, inspire a shared vision, Enable others to act, model the way encourage the heart.

5. SKILLS REQUIREMENT

Mainly LIS professionals should have to acquire the following kinds of skills to impart the service to its target users;

5.1 Technical Skills

We are living in the ICT environment, so the LIS professional need to develop extraordinary access skills. Professional are required a technical skills, which are to be emphasized in modern era, are skills required to sift analyze, synthesis, assimilate, interpret and reformulate the information accessed and retrieved.

5.2 Competencies

Competencies required for a LIS professional in the management of libraries in the modern era. Internet, navigation, browsing, creating home page, content conversion, downloading techniques, digital preservation and storage, web authoring, multimedia indexing, cataloguing and classification of digital documents, online optical information, conversion of print media into digital media, development of machine readable catalog records, etc.

5.3 Managerial skills

In the modern era the managerial skill expected of LIS professional is quite vast. The managerial skills required for working in the ICT environment. To start with technological awareness coupled with skills for technology and product is fundamental. LIS professional need to have managerial skills required for information management in team. A sort of leadership as well as fellowship skills is required to work in teams. [8]

6. CONCLUSION

The recent development of Information Communication Technology is playing a important role in restructuring of the libraries. Transfer from human dependent operations to machine dependency. In this recent development of ICT, we have seen radical changes in information field , especially in relation to collection, storing , processing and transmitting of information. LIS professional in the digital era will become the guardian of digital information and will be the vehicle to preserve democratic access to information. The final outcome of becoming aware of and recognize opportunities for liaison still need to be realized. While some libraries are naturally more suitable for and comfortable with this role, others need active encouragement, positive experience and a supportive environment to realize their potential.

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Knowledge for All: A Ten Step Strategy for Self-Sustaining LIS Professional Associations

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Abstract: Professional associations, society's, academics and foundations forms backbone of the professional development. In a developing country like India the role and importance of library associations in the development of libraries is realized differently as it varies widely from state to state. In terms of quantity India has far more number of library associations than any developed country but unfortunately none of the library association in India is qualitatively better than those in the developed countries. The biggest problem associated with the library associations in India is insufficient funds (even to run day to day activities). Library associations in India usually thrive only on membership fees and sale of its publications. Conferences and seminars conducted now and then also provide additional income to run the association. Very few LIS associations have sufficient assets to nourish their activities. It is the time for the associations to plan for fund raising activities by exploring new possibilities. The promotion of consultancy, marketing and conducting need based education and training programmes will go a long way in strengthening its financial resources further. The mission of all LIS professional associations should be to promote the highest quality of library and information services, public access to information and knowledge for all.

Library associations have had a presence in India since early nineties are facing significant financial crunches as they move into digital future. An attempt has been made through this article to suggest a ten step strategy to strengthen the financial health of library associations in India. Authors have tried to explore the extent to which library associations seek to protect and advance the interests of members by responding to the ongoing changes and preparing them for the future. The challenge for library associations (in the way forward) lies in finding innovative and creative ways of fund raising in order to become self reliant and self sufficient.

Keywords: Library Associations, India, Fund Raising,

1. INTRODUCTION

India has over 50 library professional associations & societies. To name a few Indian Library Association, Indian Association of Special Libraries and Information Centres Medical Library Association of India Bengal Library Association, Andhra Pradesh Library Association, Andhra Pradesh Public Library Association, Madras Library Association, Karnataka Library Association, Punjab Library Association, Kerala Library Association, etc. These LIS professional associations in its continuing education programmes conduct short term courses, workshops, seminars etc. and bring out various categories of publications from time to time. However, quality of most of the activities of the library professional associations & societies in India is below mark because of in-suffient financial resources. Some of the well known LIS associations in India are:

a) Indian Library Association [ILA] http://www.ila-india.org/
b) Indian Association of Special Libraries and Information Centers [IASLIC)] http://www.iaslic1955.org/
c) Society for Information Science [SIS] http://sis-india.netfirms.com/
d) Kerala Library Association [KLA] http://www.keralalibraryassociation.org/
e) Gujarat Library Association [Gujarat Granthalaya-Seva Sangh - GGSS] http://ggss.org.in/
f) Madras Library Association [MALA] http://www.accel-india.com/mala/
g) Bengal Library Association [BLA] [Bangiya Granthagar Parishad] http://www.blacal.org/

h) Delhi Library Association [DLA] http://www.dlaindia.org/

i) Bombay Science Librarian's Association [BOSLA] http://www.bosla.org.in/

j) Indian Theological Library Association [ITLA] http://www.geocities.com/itla_in/home.html

k) Society for Advancement of Library and Information Science [SALIS] http://autolib-india.net/salis.html

l) Medical Library Association of India [MLAI] http://pgimer.nic.in/Medical%20Library%20Association.htm

Unfortunately, most of the websites of LIS professional associations in India are either not regularly updated or can not be accessed/searched.

2. WHY PEOPLE JOIN ASSOCIATIONS ?

Library and information associations play a vital role in the development of the Library and Information Science profession and socio-economic transformation of communities by ensuring that information institutions render quality information services. By organizing librarians and information professionals, library associations create a forum for meeting, exchange of views, sharing and solving technical problems and learning from each other which is important if similar problems and challenges are to be collectively addressed (Russell, 1989). Professional associations encourage members to contribute to research and publication in there field subject. In India, as in other developing areas, associations suffer from such problems as lack of office/headquarters and permanent addresses where, for instance, to send subscriptions and for correspondence. Lack of office space and permanent staff, insufficient funds, poor communication within and outside the association, leadership needs and many other problems continue to challenge the existence of these associations. Situations like these hinder associations' effective contribution to the development of the LIS profession, seriously undermining participation by members who may perceive them as having nothing or little to offer.

The basic objectives of any LIS professional association should be:

a. To unite librarians, information scientists, libraries, persons and organizations connected with their subject field;

b. To co-ordinate and co-operate with concerned authorities for developing of all aspects of library, documentation and information services;

c. To provide professional advice and to promote, facilitate and assist in the use of new technologies in the field;

d. To safeguard the professional status of librarians and of information scientists by making recommendations to Government on legislation and other matters affecting libraries;

e. To organize meetings, lectures, workshops, seminars and visits to promote effective LIS profession;

f. To safeguard and promote the rights, privileges, status, interests and welfare of the LIS professionals;

g. To organize, conduct and control the professional education and training of LIS persons;

h. To promote and facilitate the study, teaching and research in LIS;

i. To co-operate and co-ordinate with other establishments and associations both national and international level and

j. To do all such acts as are deemed necessary or expedient for the attainment of the aims and objectives of the association.

According to a survey of librarians, (Frank 1997) majority of the respondents considered networking with colleagues to be most important reason for their joining professional associations, while others felt that the professional membership was important for retention, tenure, or promotion, and they used professional memberships to influence professional goals and to keep up with developments in the field through professional journals. A very few members used LIS association membership to speak or publish. Information professionals recognize that they need relevant information to be effective in their positions and that practical up-to-date information is shared at association conferences and in association publications, list servers and websites.

For new members of the LIS profession in particular, these contacts allow them to be exposed to a variety of viewpoints, encouraging them to think creatively and look beyond the routines of their Institutions. Through associations, librarians can also contribute to the profession's body of learning by publishing in association journals, newsletters, and conference/seminar proceedings and by presenting programs at conferences and continuing education courses. For those looking for upward career movement, associations provide an opportunity to develop leadership skills by serving as leaders/ office bearers in committees, interest groups, divisions, and executive councils. Such positions give the professional a chance to enhance his or her leadership, planning and organizational skills and to demonstrate these skills to others.

3. LOOKING BEYOND INDIA

Before discussing LIS professional associations in India let us know a little about LIS professional associations in developed countries:

- The American Association of Law Libraries (AALL) is a nonprofit educational organization with 4,800 members dedicated to serving the legal information needs of legislators and other public officials, law professors, and students, attorneys, and members of the general public.
- The Association of Research Libraries (ARL) is an Association of 121 research libraries in North America. ARL programs and services promote equitable access to and effective use of recorded knowledge in support of teaching, research, scholarship, and community service.
- The Special Libraries Association (SLA) is an international association representing the interests of nearly 15,000 information professionals in over 60 countries. Special librarians are information resource experts who collect, analyze, evaluate, package and disseminate information to facilitate accurate decision-making in corporate, academic, and governmental settings. The Association offers a myriad of programs and services designed to help its members serve their customers more effectively and succeed in an increasingly challenging environment of information management and technology. SLA is committed to the professional growth and success of its membership.
- The American Library Association (ALA) is the oldest and largest library association in the world, with more than 65,000 members. ALA is home to eleven membership divisions, each focused on a type of library or their function. It also includes round tables, groups of members "interested in the same field of librarianship not within the scope of any division." A network of affiliates, chapters and other organizations enables ALA to reach a broad audience. In July 2008, the American Library Association (ALA) launched an innovative project to track and measure the impact of gaming on literacy skills and build a model for library gaming that can be deployed

nationally. Funding for the project will be provided by a $1 million grant from the Verizon Foundation.

- The Medical Library Association (MLA) Board of Directors has approved a $5,000 donation from MLA's Medical Library Disaster Relief Fund, part of the association's Librarians Without Borders (SM) program, to the Chinese American Library Association (CALA) to support earthquake recovery efforts in China. At least twenty-one libraries were severely damaged or destroyed in Sichuan Province. CALA has also set up a donation site for those who want to contribute.
- American Society for Information Science and Technology (ASIS&T) has existed for over 70 years and has members in over 50 countries worldwide. It has over 56 chapters throughout the U.S. and abroad and 20 SIGs in a variety of fields, such as bioinformatics to visualization, images, and sound.

4. TEN STEP STRATEGY FOR SELF-SUSTAINING LIS PROFESSIONAL ASSOCIATIONS

4.1 Membership Drive

Raising awareness on library associations and their contributions to LIS developments should be based on objectives and programmes. It must be periodically evaluated to facilitate focused and proactive programmatic approaches to raising funds.

Major source of financial survival for LIS associations in India is funds generated through membership fees. Many professional associations have substantially reduced membership fees for students who are still continuing studies in college. Library associations in India should also provide a facility to potential members to pay membership fee in installments and similarly for the students, this membership fees can be highly subsidized. Efforts should be made to rope in cash rich corporate/ industries as corporate members. Unfortunately none of the library professional association in India has facility for online subscription through their website (online credit card payments). Development of such facilities is not difficult but its unavailability hampers a lot of potential users to become active member.

It is strongly recommended that if, and when, an association has any money for investment in services, the association should hire full-time staff member. The benefits are very clear. The staff can provide continuity and ensure that the necessary statutory obligations are fulfilled.

4.2 Short Term Courses/Workshops

To improve the professional competency of LIS professionals, by organizing short-term training courses in various topics is now a regular feature of the continuing education programme. Library associations in India regularly conduct several short time courses/workshops on professional development of LIS professionals in the field of library classification, library cataloguing, indexing, computer applications, digital library, multimedia, information and knowledge-management, collection management, content management, preservation and conservation, industrial information system and management, Web design, AACR II, MARC/UNIMARC formats, multimedia and more recently on setting digital libraries using open source softwares. Such continuing professional development activities must be intensified and carried on in a consistent manner.

An excellent example is of Delhi Library Association. The finances of Delhi Library Association have risen from a modest figure of 1,000/- in 1953 to about Rs. 27 lakhs in 2007. This measure of financial stability is largely due to the training programmes and other projects being conducted by the association. A few of these courses are usually held in collaboration with University departments, specialized institutions, national library of India and other professional bodies etc. at different parts of India. It is suggested that all professional associations in India should conduct all future courses jointly (co-sponsored) and their dates should be informed well in advance through Internet. If possible, in future the study material of these training programmes should also be put on Internet as open source for maximum use.

4.3 Seminars and Conferences

In India the trend is gradually moving towards joint sponsorship/co-sponsorship of seminars/ conferences. Some of the recent examples are:

- National Workshop on Developing Digital Library Using GNU E-Prints, 16-20 September 2008, Mahatma Gandhi University Library, Kottayam, Kerala

  Organizers: MG Uni Lib and INFLIBNET
- NACLIN-2008: Eleventh National Convention on Knowledge, Library and Information Networking, Nov 4-7, 2008, Karunya University, Coimbatore

  Organizers: DELNET and Karunya University, Coimbatore
- International Conference on Empowering Knowledge for All: Role of Library and Information Centers, November 12-15, 2008, TISS, Mumbai

  Organizers: TISS and ILA
- ICoASL-2008: International Conference of Asian Special Libraries, Nov 26-28, 2008, India Islamic Cultural Centre, New Delhi

  Organizers: SLA Asian Chapter, SLP and IASLIC
- 23rd IASLIC National Conference on Library Profession in Search of a New Paradigm, Dec 10-13, 2008, Bose Institute, Kolkata

  Organizers: IASLIC and Bose Institute, Kolkata
- ETTLIS-2008: International Symposium on 'Emerging Trends and Technologies for Libraries and Information Services (ETTLIS), Jaypee Institute of Information Technology University, Noida, India, Dec 18-20, 2008

  Organizers: Jaypee Institute of Information Technology University, Central Library, Delhi College of Engg and SALIS-Delhi Chapter
- International Conference on Knowledge Networking in ICT Era, Jan 22-24, 2009, Crescent Engineering College, Chennai

  Organizers: Crescent Engg College Library and SALIS

4.4 Joint Sponsorship

All the activities of library associations should be sponsored by external agencies/Institute/vendors etc. either individually or jointly. This will not only reduce financial burden on the library association but also in a few cases, these sponsored activities can generate resources for associations.

During last five years Madras Librarians Associations (MALA) has organized various lectures, orations, seminars, conferences and workshops for benefit of LIS professionals. The most important

point to note here is that all these events were jointly sponsored by one of the following listed agency/ Institution:

- Roja Muthiah Research Library Trust
- Madras Book Club
- TN Police Academy
- United States Consulate General, The American Library
- Tata Consultancy Services
- CSI, IEEE CS.
- Sundaram Medical Foundation.
- RCIS
- Dept. of Information Science, University of Madras
- Guindy Campus Library
- The British Council
- Directorate of Public Libraries, Chennai
- Computer Society of India

Thus, MALA was not only able to organize a large number of activities but also generate sufficient funds for running its day to day affairs.

Similarly KLA has jointly organized two workshops with UNESCO in 2007 and one national seminar in 2005, which was co-sponsored by Raja Ram Mohan Roy Library Foundation, Kolkata.

4.5 Releasing Advertisements

Releasing advertisement in newsletters/journals/conference proceedings' etc and also on website of Library associations on Internet site can be an important source of revenue generation. These advertisements reaches more qualified information professionals, as the members trust these publications to bring them the most accurate and up-to-date information on developments and trends in their profession.

4.6 Organising Exhibitions

LIS professional associations in India should on a continuous basis organize exhibitions for providing a platform to vendors for marketing their various products and services. Exhibitions can be held not only during conferences/seminars but should also during workshops. The vendors participate in exhibitions as it offer them:

- an opportunity to interact with decision-makers who know the information industry
- exposure to the most qualified audience in the information profession

4.7 Publications

Ever since its inception, most of the professional associations are publishing newsletter, journals, monographs, conference proceedings and other types of documents. With the continuous increase in cost of paper, printing, correspondence cost between authors and editors, distribution cost, etc. this publication work has become uneconomical. Therefore, most of the newsletter and journals published by LIS professional associations in India are delayed by over six months. One can also find a reasonably good number of combined issues of newsletters and journals (for saving postal charges) because of financial constraints.

A two step action plan is suggested to overcome this problem. LIS professional associations should gradually stop printed version of newsletters & journals and move for online content management system. There are many LIS professional groups actively maintaining blogs for information communication. Indian LIS professional associations can also jointly develop a single blog on Internet which can be used/serve as newsletter by all LIS professionals in India. A few advertisements can also be placed on these blogs for revenue generation. A single LIS information blog shall not only save considerable funds but shall also contain more current news/information for the LIS professionals, on a single site.

Secondly printing of LIS Journals & bulletins can also be made online. It means online submission of paper/articles, online editing by editors, online incorporation of corrections, online correspondence and open access publication, so that a maximum number of LIS professionals can use these publications.

Another surprise you find only in India is the overflowing association's office with old publications. These publications were printed years ago, but could not be sold because of poor marketing. Efforts should be made by LIS associations to sell these at highly discounted rates to the users, so that at least a part of cost is recovered. Associations with liberal views can also put contents of all these publications on their websites in open access. Recent efforts made by IASLIC in selling old books/ conference proceedings at 70% discount is a commendable step in this direction.

4.8 Translation Services

Translation services can be provided by library associations at competitive rates to the potential users. This can be a useful resource generation tool for professional associations. Presently IASLIC undertakes English translation of documents from Russian, German, French, Chinese, Japanese, etc. and also undertakes imaging of documents for archiving. Money generated by providing these translation services can be used for upliftment of LIS profession/professional in India.

4.9 Library Consultancy Service

Library Associations can undertake consultancy services like creation of computerized bibliographic databases, retrospective conversion of records, preservation & conservation of documents, cataloguing, classification and stock verification in public and private organizations on competitive rates. Earlier, GILA (now AGLIS) was providing consultancy services for generating revenues. IASLIC also provide consultancy services but on no-profit basis.

With a view to generate additional revenue, the Delhi Library Association has recently started taking consultancy projects in Library and Information Centers. The association has undertaken the job of indexing biomedical journals under NIC/INDMED Project. With the most competitive rates, DLA have been entrusted with the job of indexing biomedical journals. Besides generating additional revenue, the project has helped professionals in acquiring competency in indexing and abstracting of scientific writing/articles.

4.10 Recruitment and Job Listing

Professional associations can have some mechanism for sharing job listings. There could be a "classified" section in the journal or newsletter, a section on a web site, or a separate publication available to members only. The association can start charging some fees for the fresh recruitments made possible with the help of services offered by library associations. Charges may be equivalent to one month salary/pay earned by the fresh recruit.

5. RECOMMENDATIONS

Basic mission of Library Association is to develop products and services which offer practical solutions to the problems in the fast changing world; to provide leadership for the development, promotion and improvement of library services; promote excellence through continuing educational program, publications, awards, communications and to undertake such other innovative programs. The purpose of association is also to develop, exchange, expand and enhance the professional knowledge and status of the profession. Fund rising activities, membership drive etc. are therefore strongly needed and should be planned in huge way.

6. CONCLUSION

There are some excellent reasons for joining one in your chosen field professional associations, as most of the associations publish newsletters/journals and distribute them freely to their members who are helpful to keep you up-to-date on issues and developments in professional field.

No library association can survive, sustain, grow, or remain relevant in the modern age if it does not address to fund rising needs.

Today the Library and information associations, just like their constituencies, stand at a turning point in their individual and collective histories. To create a healthy future, the office bearers of these LIS organizations must devise flexible and forward-thinking strategies that connect the individual member with the organization's ultimate goals. Once such strategies are created, execution becomes paramount to realization of a healthy future. The best strategy is the one that is fully executed.

The challenge for library associations in the way forward lies in finding innovative and creative solutions for dealing with the issues which have been problematic for the organization and which have worked against its effectiveness. Issues such as the development of memberships, quantitatively and qualitatively, transformation into financially viable entities, and engagement in public/outreach activities must be the major focus. Additionally, continuing professional development activities must be intensified and carried on in a consistent manner.

Library associations provide an opportunity for librarians to meet and share experiences and learn from each other. They offer a range of services to members and look after their interests. For outsiders interested in dealing with the profession, they act as the ideal contact point. Although library associations do serve the needs of their members, ultimately, the long-term benefactors are the end-users of the services that these members provide. They lay down standards for performance, protect the continuing existence of special services and monitor the trends in user-needs.

The cooperation and understanding of library association members in India is not very high and shortage of funds is a real problem. Financial constraints and lack of permanent staff are major difficulties. Therefore most of Indian library associations lack strong publication/training programs.

Library associations should merge its few activities with other like-minded associations, or if not merge, at least work closely with them. Working in partnership with other international bodies (such as IFLA, UNESCO, etc) to encourage innovation within the library and information sector, they would be in a stronger position to promote the positive contribution made by library and information services. Library associations are also feeling pressure to operate more closely with one another. Dearth of sufficient financial resources is a continuous topic of discussion within the associations. The associations finance their operations mainly by membership fees and public funding received for example from the Ministry of HRD.

The lectures, workshops, seminars, and conferences have enabled members to share information and ideas about new trends in the profession, assisted them in the development of leadership skills, contributed to their overall career development, and prepare them to develop solutions to various problems.

In order to develop the quality and quantity of memberships, library associations must aggressively market themselves their products and services to all categories of the library and information personnel. This is to ensure that the mutual value of the association and members' involvement are clearly understood and appreciated. A definitive marketing strategy is therefore required to enhance personal and professional development and the development of a sense of professional culture and community.

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National Library Associations in the Knowledge Society: A Preview of their Ensuing Role

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Abstract: The knowledge society has been responsible for changed modalities in the socio-economic sphere. The ICT has given the visibility to knowledge society and also brought transformation in their roles, objectives and functioning. The Libraries are the integral part of the knowledge society, and the National Knowledge Commission has also considered them truly potential agencies in the dissemination and access to knowledge. The role of National and International Associations in the development of Libraries across all nations in notable. They have some renewed roles to play in the knowledge society. The paper previews renewed roles of the National Library Associations in general and Indian Library Associations in particular and envisages that they have to be proactive to the new socio-economic environment.

Keywords: Knowledge Society, Library Associations, National Knowledge Commission

1. INTRODUCTION

The coming of knowledge society has ordered many modalities – and one of them is redefining the role, objectives and functions of representative social, economic and political institutions and organizations, without distinction. The technology has been chief architect for giving the visibility of knowledge society, and as Martin puts "it is characterized by large scale computerization, enormous growth of electronic information and its world wide access and transmission as the key factors of the present change and thus the economic profile is heavily influenced by the market and employment possibilities of Information Technology". Each one has been resolute in bringing out the changes – desirable or undesirable. The on-set of the twenty first century is rightly branded as a knowledge era where knowledge primarily a vital resource instead of labour and capital. Scholars have opined that in the past 200 years, world has moved from an industry and transportation based society to a society based on knowledge and information. Today knowledge and information are blending the people and many are earning their living by acquiring and transferring information in one way or the other.

It is a "work-in-progress" society that invests significantly in harvesting the available skills, technology and learning towards development. Knowledge society presupposes not just literate or a computer literate society, not even educated workers, but knowledge workers. Essentially, the knowledge workers are highly motivated and empowered with skills. They are not belonging to ruling class but they act as 'leading class' of workers. Thus knowledge society is far more competitive and specialized than any other societies existed before.

Efficient utilization of knowledge creates wealth in the form of better health, education and infrastructure. Knowledge society has two components-societal transformation built an education, healthcare, agriculture, governance and wealth generation. Creative capacity, innovative talent and ability to determine the relevance of the products and service are the most important indicators of the knowledge society.

All the countries in the world are moving towards being knowledge societies and there by reiterating that they are the learning societies. In a knowledge society learning and education have a very high priority and in the process most of the governments spends significant amount of their budget to promote higher learning and education. The congenial relation between libraries and society need no

over-emphasis, as suitable literary warrant has its basis. The inclusion of Libraries as part of study by the National Knowledge Commission rededicates this fact they are the integral parts of the knowledge society. To be in tune with the growing and mature knowledge society, various professional institutions will establish the associations to demonstrate their activities Any organization, institution or an association as part of this concept has also a significant role to play in the knowledge society. Hence in these changing times it is imperative to study the role of National Library Associations in the transition.

From the early beginning of the 19th Century, Associations and Societies were set-up, as the vanguards of nations knowledge output. The Library Associations throughout the world were also associated actively in this task. The role of the American Library Association, in extending the Library services to the largest population of its host country is well accounted by Ranganathan in his classic work, Five Laws of Library Science. The Asiatic Society, the American Chemical Society, Indian Society for the Cultivation of Science and many others in this line, have marshaled their activities in enriching the society with indigenously generated knowledge and providing its access worldwide.

2. LIBRARY ASSOCIATIONS AND KNOWLEDGE SOCIETY

The birth of American Library Association on 5th October 1876, mark the beginning of a new era of Library Associations in the modern era. The Associations, societies learned institutions are the powerful forces to voice of the professionals to resolve their problems, concerned with the welfare, status, working conditions, physical facilities, education and training including the research and development activities of their wards. Although the central purpose of the associations has always been to serve the needs and to protect the interests of the community, they strive to broaden the purpose and serve the over all needs of the nation.

Parallels in India and other countries are seen in the establishment of Library Associations. The Madras Library Association, the Bengal Library Association and the Baroda Library movement are all promoters of library development. The impetus to Library movement in India was initiated with the establishment of Indian Library Association in 1933, and similar efforts in other spheres of library development. If the spread of Library Culture is ever visible in any country, it is the contribution of the Library Associations in their respective nations either partially and fully.

Associations become more common and significant as society advances in Science and Technology, complexity and scale of activity increase and their study becomes the part of study of social change. In the contemporary situation, due to rapid social change, associations are important as a means of organizing people in order to achieve new ends. They are also of great significance to the professionals in that they reveal cultural values and goals that the members themselves are unable to formulate. Another important aspect of rapid social change is the way new forms of organizations create new roles and relationships.

But there is a widespread change in the scenario of professional association's roles and objectivity in the knowledge society now. The concept of social networking, a web 2.0 version facility has in store new concepts that can enhance the images of the professional associations. They can become more pro-active to device and develop out-reach programmes, not for the profession and professionals within, but outside in the realm of entire society.

Basically Library and society relation persists since the libraries received the democratic image in late 19th Century. The Libraries, especially the public libraries, joined with other identical organisatons were aptly designated as social institutions. The ***National Knowledge Commission*** in India,

considered the libraries, particularly the public libraries as means to access to knowledge, and stated that "the role of libraries in providing widespread and inclusive access to knowledge is widely acknowledged". In a new and changed socio-economic environment their role is vastly extended from preserving our cultural heritage to provide richly enhanced services to millions of users comprising students, researchers and members of the public as a whole, though their primary functions regarded as the acquisition, preservation and to provide. access to wide ranging, high quality information, at local, national and global levels Libraries have key role to play in underpinning learning in its broad sense, both as a formal activity in an institution and informally within the community.

History of LIS profession reveals that the libraries have always nurtured and championed the democratic role and power of printed world and promoted its use in a free and open society. Right to Information has been widely recognized now as the fundamental principle of democracy and right to know is the gist of new social order. Instances and evidences are in plenty to prevent access to information where retardant forces within the society marred the citizen's right to know and to gain free access to information. Political, religious and social motivations have resulted in these so called anti-social activities and the Libraries often became targets of such disgraces in the context. Here comes the critical role of the library associations. When the main objectives of professional associations focused on the welfare of the profession and of professionals, new roles started emerging to make Library Associations to shoulder additional responsibilities and in India and elsewhere, the literature on their activities emanates more on, education, training, continuing education and building and developing training packages for repositioning and renewal of the profession. At the most when crisis demanded , the Associations would be lobbying in government for the better status for the professionals, good practices and proven potential for their profession, and demanding relevant library and information education programmes from the LIS schools. This was the situation in a conservative society, where the activities, programmes of the Library Associations in most of the countries were confined to within self.

In consonant with changes, the National Library Associations have been endeavoring considerably by devising the tools and techniques of educational provisions, legislation programmes facing the complex litigations and strengthening the advocacy. For instance the American Library Association strongly protested the intervention of the Federal Government in the lending rights of the public libraries in its country.Thus they became advocates of democratic functioning and provide a forum and vehicle that allows the voice of the libraries to be heard. According to the former president of ALA Nancy Kranich "An informed public constitutes the very foundation of a democracy. Libraries are the cornerstone of democracy in our communities because they assist the public in locating diversity of resources and in developing the information literacy skills necessary to become responsible, informed citizens who can participate in our democracy". Associations create a framework that enables libraries and librarians to increase their effectiveness in empowering the user community to participate in a knowledge Society. Consistent efforts are being made to educate and keep up to date the members through the National and regional conferences/Seminars. In addition, News letter, websites, e-mails forums are some of the essential initiatives of the associations in keeping the members professionally competent.

3. ROLE OF LIBRARY ASSOCIATIONS IN THE KNOWLEDGE SOCIETY

National Library Associations have to play a significant role in strengthening the abilities of the professional workers to be proactive in promoting the lifelong learning in the networked environment.

. Library Association needs to focus the attention to enable the professional workers to inculcate and imbibe such skills and techniques to provide access to a vast range of global resources using both traditional and electronic media. It is also necessary to enhance the new skills and methods to assist the users to use computer, to navigate around the set of databases and also act as able mediators between the learner, provider and learning resources. It is again essential to make provision for the professionals to develop the latest skills of critical evaluation and interpretation. With which the users can maximize their use of the new global network.

Members of the Library Association represent many regions, many places and libraries of all sizes and types. Library users are the people of all age groups, all religions and all races. In fact, librarians form a diverse group and serve even more diverse groups. The common language of the librarians is the language of information. They serve the common community of users in schools, colleges, Universities, Public libraries and corporate sectors etc. Librarian's common work is to provide access to information to all who seek it. Now, the common future includes Internet and e-books, digital information, wired communities, virtual buildings and global information sharing. Therefore, it is necessary that the National Library Associations should have all the working professionals at different levels as its members to sustain the profession and professionals in all the critical junctures.

4. INDIAN SCENARIO

Unity in diversity is the characteristic feature of India as it is representing in its population, multi-religious, cultural, linguistic diversities, yet is bound with the spirit of being Indian.. Though India has suffered social, economic and educational set back due to the frequent invasion and as a consequence of transfer of power from the Mughal to the British, she also gained much that proved to be of lasting value. The contact with the west had opened out a window through which her people could look at a world, which was rapidly expanding, and making progress in material attainments.

There are few library associations in different part of India whose contributions to the development of national consciousness were immense and deserve to be remembered by the future generation of library professionals. Association is a yardstick for measuring the growth of awareness of problems and needs of a country with in a given time. Founding fathers of Librarianship in India have very clearly visualized the commitment of the associations to the following vital aspects;

1. The furtherance of library movement in India.
2. The promotion of the training of librarians
3. The improvement of the status of librarians

Some of these activities are well reflected in the overall performance of Indian Library Association, Bengal Library Association, Andhra Pradesh Library Association, Andhra Pradesh Public Library Association, Madras Library Association, Karnataka Library Association, Punjab Library Association and Kerala Library Association. There was time when the libraries and library associations joined hands with government to propagate government policies and programmes. Some of the Library and literary associations in India and in Karnataka were established to support the freedom struggle during the freedom movement. The example of Karnataka Vidyavardhaka Sangh comes to the mind which through its library services tried to reach the social milieu, to instill the spirit of freedom struggle. The Servant's of India Society is another such example in this context. Such objectives of the professional associations have taken a back stage today, due to more conservative and materialistic approach adopted by them of late.

The associations in their formative period were adorned by the men of eminence who have dedicated themselves to the cause of national development. They were the great visionaries supported by very committed people who were the first rate scholars in their own field of activity and worked to fulfill the objectives set by the elders.

Library Associations and Societies, Academies, Trusts and Foundations have endeavored a lot to give a new face-lift to the professionalism in India. Presently, there are associations and societies representing different types of Libraries and Information Centers. Most of them are making consistent efforts to develop the associations on the pattern of the associations of United States of America and United Kingdom. Many of them are emulating the world-recognized associations. But, there are some constraints of peculiar nature, which are coming in the way of progress.

It is observed that the associations in spite of national and regional recognition constantly striving;

i) To promote the spirit of professionalism.

ii) To see that the gaps in the professional activities are filled.

iii) To bring together other smaller organizations and associations in the neighborhood.

iv) To bring professional talents together.

v) To nourish the profession to inculcate good professional ethics.

vi) To promote education and training.

In spite of the success story of the achievements of the library associations, there are some lacunae in the library development programmes in India. India is a vast country having different political parties both at the center and the states. The fluctuations in governments are very common. Whatever the best work done in promoting the library development with the mediation of the Associations may or may not be continued. Hence the development of the libraries is hampered. Even the Associations have inculcated the spirit of the political system and more involved in elections and making efforts to gain the power. This has resulted in slowdown of the development. Associations at the National level like ILA, IASLIC, and SIS have done some noticeable changes and developments. They are hardly continued by the next group of office bearers. They may go for their own strategies. Therefore the Associations have to have a plan of action to withstand the test of the time.

It is strongly felt that the Associations should take a broad outlook and consider the following aspects in order to gain the national and international recognition;

(i) Maintaining the task force of members to analyze professional problems and to find ways to solve them.

(ii) Strive for representing the government formed task forces to form a part of the nation building.

(iii) Conduct tests and inspection and grading services to help and ensure professional satisfaction.

(iv) Developing standards, grade-and-quality labeling to help the professionals to choose right products to serve the needs of the users.

(v) Workout the method of operation to introduce accreditation and assessment of Library and Information Science education and training.

(vi) Formulation of lobbying group to interact with the administrators, management, bureaucracy and the local governments to impress upon them the need for giving the library due consideration of essential services.

(vii) To workout the practical and viable norms and standards for LIS programmes through distance mode of education.

(viii) To formulate national Information Policy and advocate for its implementation.

In this direction Library Associations in India have made very marginal progress. Some of them have Special Interest Groups in very vital areas of the profession like Library Legislation, Academic Libraries, Special Libraries, Government Libraries, LIS Education and Research, Information Technology Application etc. But the aspects of Standardization, Accreditation, and Curriculum Development providing choice based credit system, interdisciplinary research, collaboration and linkage with national and internationals organizations and associations etc., are not included. Time is ripe and the new millennium demands that the appropriate action be taken by the associations in India in this regard.

Dr. S.R. Ranganathan, the father of library movement in India has guided the activities of Madras Library Association since its inception with his multifaceted professionalism. His contribution to ILA and many other regional library associations are worthy appreciation. He was responsible for inspiring innumerable followers all over the country to carry the mission forward. The achievement of ILA, IASLIC, RRLF and SIS have set a good trend of bringing out publications, organizing seminars, conferences and workshops, promoting education and researches encouraging the regional and local level associations. Comparatively speaking much more remains to the achieved by these organizations. A new visionary approach to National and Regional Library Associations in India would be drawn from some of the recommendations of the National Knowledge Commission. In the Knowledge society, creation, building and developing knowledge infrastructure, is one of the main functions before the government and others. The National Library Associations can actively participate in implementing the recommendations of the National Knowledge Commission, relating to Libraries, such as. setting up the National Commission on Libraries, Census of all libraries, LIS education and public private participation in LIS development. The NKC has also made a recommendation on Translation of pedagogic materials, and Indian Library Association can take up the task of translating the selected Indian and foreign textbooks in Indian languages, and also some cooperative publishing programmes for the benefit of Indian student community in LIS. At present there is greater need to propagate the Information Literacy programmes to reach our Rural population, and for which it can seek the help of not only the NGOs but also the Department of Information and Publicity, which has been actively engaged in such promotional programmes to reach the rural population. In this manner the gap of 'digital divide' between rural and urban population can be reduced.

5. CONCLUSION

In the Knowledge society, creation, building and developing knowledge infrastructure, is one of the main functions before the government and others. The Professional associations, especially national library associations have a greater role to play in this context. Libraries since the early ages of civilization are engaged in the process of preserving knowledge for posterity. Today they have major role to play, as the knowledge society concept has spread to entire population of a nation and the professional associations have to be pro-active, to join hands with others, the NGOs and Government, to participate in the social development work. The ICT has provided for an excellent facility in this regard, through various avenues, such as web portals, blogs and so on. The Library associations have, through the services provided by their members, understood the informational needs of the society. The Information Literacy programmes which were confined to the four walls of the Libraries hence before, can now be spread across the length and breadth of the society, to empower the society to search and gather its own information. Today many residential associations are joining hands with NGOs and other

voluntary agencies, to the welfare of the society as a whole. For example, CIVIC and Janagraha are two NGOs which are providing opportunities for the residents' welfare associations to make efforts to reach the society as a whole the welfare services and programmes created by the government. The Library Associations can also join similar larger bodies, at local and national level to assist in their programmes. This is the best platform for the Library Associations to invite the NGOs and other voluntary organizations and the Government Departments in this context.

Library Associations in India suffer from the financial assistance both from the professionals and the government. They thrive only on membership fees and sale of publications. Conferences and Seminars conducted now and then provide the additional income to run the association. Very few associations have assets to nourish their activities. It is the time for the Associations to plan for fund rising activities and exploring the possibility of philanthropy. In addition the promotion of consultancy, marketing and conducting need based education and training programmes will go a long way in making the associations to strengthen further. There is a need for promoting the research activities and exploring the funding agencies to fund the research. Institution of awards, prizes, fellowships etc., will help in changing the attitude of the professionals and developing the regard for professional activities.

It is envisaged that the national associations in the knowledge society will enable and empower the professionals to promote the use facilities within the libraries and how to make the libraries a national asset. Associations will also set the mindset of the members that though their role is changed in the event of fast growth of Internet, they will be more necessary than ever for the healthy growth of the knowledge society. All said and done, if librarians are united through their associations' affiliation the intellectual capital of the country can be enhanced in many folds and foster and give a new vision to the knowledge society in 21st century through their renewed roles.

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Role of Library Associations for Professional Development

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Abstract: The association is a congregation of like minded persons with a fixed goal to pursue. These associations are there to protect the interest of its members, to give them recognition, to assist them in their development, to guide them in their pursuit. These give them a common platform, from where they give vent to their feelings. These help them to polish themselves and provide an escape from regular rut once in a year. Man how-so-ever great, how-so-ever resourceful, how-so-ever intelligent, is nothing in his entirety if left alone. Therefore he/she has to take recourse to some official bodies like ILA, IASLIC, MLAI, SALIS and so on. These provide them a force to reckon for, to excel in their field, to be remembered in the gone era.

Keywords: Role Of Professional Association, Professional Development

1. INTRODUCTION

The associations in every faculty keep on working hard at the time of their workshops, conventions and annual meetings. These endeavor to put a great show so that their members may be impressed upon. Their annual general bodies meetings take a stock of whatever happens to their members during their tenure. The activities of their members, their contribution to the development in respective areas are highlighted. They are proper support for them

2. HISTORY

The mark of nineteenth century brought the development of many libraries in India. By beginning of twentieth century a need was felt to develop an association of libraries to have better co-operation among the libraries across the country. An attempt was made in 1933 to set up library association and thus the Library Association came into existence.

Another attempt was made in 1949 and in 1955 Shri J. Saha of the Indian Statistical Institute, Shri A. K. Mukherjee of the Anthropological Survey of India, and Shri G.B. Ghosh of the Geological Survey of India issued a brief circular on June 18, 1955 convening a meeting. It was sent to a large number of librarians in India. In addition to the initiative of the three prime movers, the enthusiasm and inspiration of the late Dr. S. L. Hora, a Zoologist of international repute, and the then Director of the Zoological Survey of India was greatly responsible for the success of this venture. On 3 September 1955 at the Lecture Hall of the Indian Museum, Calcutta with Dr. S. L, Hora as the Chairman, the India Association of Special Libraries and Information Centres (IASLIC) was formally established. Dr. Hora was elected the first President and Mr. J. Saha the first Honorary General Secretary of IASLIC.

Because of the efforts of these associations, other association too came into being, which are briefly discussed below:-

2.1 Indian Library Association (ILA)

ILA was established on September 12, 1933, on the occasion of the First All India Library Conference held at Kolkata. The ILA is the largest and renowned professional body in the field of

Library and Information Science in India with a membership of more than 4000. The main objectives of the Association are: Promoting library movement in the country, Developing Library and Information Science education, Training and research, betterment of library personnel, Cooperation at the national and international levels, Promotion of standards, norms, services and guidelines, and Providing a forum for professionals and publication of materials.

The ILA holds a biennial seminar, conference, workshops and training programmes for professional development of Library professionals in various parts of the country.

2.2 Indian Association of Special Libraries and Information Centres (IASLIC)

The **IASLIC** was established on 3 September 1955 as a non-profit making national professional body to:

- promote the quality of Library and Information Services
- coordinate the activities
- to foster mutual cooperation and assistance among the special libraries, scientific, technological and research institutions, learned societies, commercial organizations, industrial research establishments as well as centres of studies in social sciences and humanities
- to improve the technical efficiency of the professionals
- to act as a centre of research and studies in special librarianship and documentation techniques
- to act as a centre of information in scientific, technical and other related fields of LIS in pursuance of the aforesaid objects.

The general body of members biennially elects 14 office-bearers and 20 members of the Council, which is the highest organ to formulate the policies and programmes of work. The Council appoints from among its members the Executive and Finance Committee consisting of 8 office-bearers and 4 members to manage the regular activities. Six Divisions are also constituted as follows, by the Council for each term:-

1. Documentation Services 2. Education 3. **Publication and Publicity 4. Library Services**
5. Documentary Reproduction and Transition 6. Cooperation and Coordination of Libraries

The IASLIC holds a biennial seminar and a conference in alternate years. Current problems of libraries and information services and other allied areas are selected as themes for discussion on these occasions. 20 Seminars and 24 Conferences had taken place at different research and academic institutions in various parts of the country up to 2003. **IASLIC has submitted its recommendations to the report of 6th Pay Commission. The rejoinder is addressed to the Chairperson of Pay Commission**

2.3 Society for the Advancement of Library and Information Science (SALIS)

'SALIS' is a association of like-minded library professionals established in March 2002. The primary focus was to provide need-based service to the profession and to work for the advancement of Library and Information Science (LIS). The current focus of SALIS is to reach the unreached LIS professionals with rural settings in order to minimize the digital divide. It also pays attention on the working library professionals of Public Libraries, the segment which almost remains as an area of neglect. Currently, it has five hundred (900) members in its fold.

2.4 Objectives

SALIS has framed its objectives by considering and accommodating the aspirations of its members particularly young and upcoming library professionals. The objectives are framed after considerable deliberations in appropriate forums. They are practicable, executable and achievable. The execution of these objectives are reviewed periodically in its Annual General Body(AGB) meetings. The President is reviewing the status of implementation of these objectives chapter wise with the office bearers of the respective chapters. The aims and objectives of SALIS are enumerated below:

- To promote the development and advancement of Library and Information Science and Technology (LIST) and all related fields
- To provide a common forum/network of Library and Information Science (LIS) professionals to meet frequently and exchange their ideas and share their experiences
- To organise and conduct events of interest to the members such as meetings, lectures, seminars, conferences, training programmes, etc.
- To disseminate important scientific, technical and other information relevant to the scope and objectives of the society through publication of newsletters, reports, etc.,
- To collaborate with the various National/International professional bodies/agencies for the development of Libraries and Information Centres, etc. as well as for the professionals
- To encourage professionals for there yeomen services to the profession by giving awards etc
- To undertake projects and conduct research, etc in various areas of LIST
- To promote application of Information Technology in Library and Information Centres in order to provide timely and quality services to the end users
- To take active measures to inculcate the reading habits for developing the society

The structure of SALIS is federal in character. There exists a central authority namely the Governing Council (GC) with elected/nominated office bearers. The GC is the apex body responsible for policy making. The role of the GC is to provide guidance and support for each chapter. Each chapter has its own office-bearers and functions under the guidance of their respective Executive Committee (EC). The EC is empowered to take decisions and is also the authority for implementation at local levels. Thus the decision making process has been decentralized. Each chapter has the freedom to organize programmes based on their local needs.

SALIS has opened regional chapters at the following cities with the basic aim of providing services with a regional perspective as well as to meet regional aspirations of its members. It is also contemplating to open a few more regional chapters in the years to come in the cities like; Chennai, Madurai, Coimbatore, Thiruchirapalli, Tirunelveli, Vellore, Nagpure and New Delhi.

More than 800 professionals all over India are members of SALIS.

2.5 Management Library Network (MANLIBNET)

MANLIBNET is the apex body of library professionals in the field of Business & Management is a movement for sharing of resources and information among the libraries by fostering a spirit of cooperation and weaving them together in a networking arrangement.

To achieve these broad objectives, Management Libraries Network (MANLIBNET) was initiated as a movement in 1998 by bringing together over 40 Library Professionals and Information Scientists at the first convention held in Ahmedabad. This was jointly organised the Indian Institute of Management (IIM), Ahmedabad and Ahmedabad Management Association.

This was followed by a series of Conferences and Seminars at various places including the Indian Institute of Management, Lucknow; Indian Institute of Management, Kozikhode; XLRI, Jamshedpur; Institute of Management Technology, Ghaziabad; National Institute of Financial Management, Faridabad; Nirma University, Ahmedabad; ICSSR, Mumbai and Delhi.

The main objectives of MANLIBNET are to provide a common forum to the professionals; and to develop understanding and co-operation particularly among management and business libraries.

2.6 Medical Library Association of India (MLAI)

The need to organize the professional health science librarians into an active and effective forum was felt for quite some time. In order to give a practical shape to the need, it was on August 18, 1980 a large number of prominent medical librarians/information scientists met in New Delhi and resolved to form the Medical Library Association of India. The dream came into reality only when it was registered in 1981 as a professional body under the societies registration act (India) 1960 with the following objectives:

1. Professional development for effective health science information and library system and services through mutual co-operation.
2. To build up a body of professional experience that could be utilized in the smooth effective functioning in libraries in the field of the biomedical and allied sciences.
3. To help libraries provide effective service to students and trainees, practicing physicians, field workers, research workers and teachers, administrators in the biomedical and allied fields.
4. To device methods and techniques for the improvements in quality of collection, storage and dissemination of information.
5. To foster mutual co-operation and assistance among the various biomedical libraries in the country and the library personnel working therein.
6. To serve as an institution for the exchange of professions knowledge and experience by organizing training courses, seminars, conferences, lectures workshops etc., and to promote the interests of the biomedical and allied sciences, libraries and librarianship.
7. To cooperate with learned institutions and interest bodies- national and international in the furtherance of these objectives.

MLAI has organized many conferences and seminars at various parts of India.

3. CONCLUSION

Associations as summarized are there to protect, to stimulate, and to rescue our fellow librarians. Therefore it becomes essential for us to provide succour and vigour to our parent bodies of associations, to work for their upliftment. **Better our associations, stronger we are.**

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Study of Authorship Trends in Indian Library Associations Conference Papers

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Abstract: The main aim of this study is to analyze the authorship trend of papers selected for presentation and included in the proceedings of 52nd All India Library Associations National conference, held at Srinagar, Uttaranchal, during 26 - 29 December 2006. In all, 126 authors contributed 67 articles. These authors are further analysed according to sex, designations, working institutions, regional area, etc. The authorship trend in ILA conference papers is highlighted in the paper.

Keywords: ILA, Conference Papers, Authorship

1. INTRODUCTION

Indian Library Association is the only biggest National Library Association in India. The members of the Indian Library Association scattered all over the country. ILA organises the National level conferences every year . During 26-29 December 2006 , Indian Library Association organised it's 52nd All India Library Conference at Srinagar , Uttaranchal . The attraction of the ILA conference is always of its theme. The theme for 52nd ILA conference was Information Commons: 'Impact on and Implications for Libraries and Information Centers'. Indian Library Association made announcement to all its members and other eminent scientists, professionals in the field of library and information science. All the selected papers are compiled into a conference proceeding. The 52nd ILA conference consists of 67 articles. The main objective of the present paper is to analyze the authorship pattern and is to identify the changing trends of authorship in ILA conference.

Analysis is made on following criteria:

1. Authors as per sex
2. Collaboration Patter
3. Joint author working institute
4. Analysis by designation of authors
5. Type of Institutions of authors
6. Geographical distribution of authors

Table1: Contribution of Authors sex wise analysis

Sr. No.	*Sex*	*Authors*	*Percentage(%)*
01	Male authors	105	83.33
02	Female authors	21	16.67
	Total No. of authors	126	100.00

It can be observed from the Table 1 that 67 articles included in this proceeding are written by 126 authors. Out of 126 authors 105 (83.33 %) were male authers and 21(16.67%) female authers . It means females are slowly coming out to express their feelings about library professional work.

1.1 Collaborative Authorship

After analyzing the authorship pattern from ILA proceedings it was found that contribution of two authors was more i.e. 30 articles (44.77 %) out of 67 articles published in this proceedings followed by single author (34.33 %) and more than two authors (20.90 %) articles.

Table 2: Type of Authorship

Sr.No.	Type of Authorship	No. of Articles	Percentage (%)
1	Single Author	23	34.33
2	Two Author	30	44.77
3	More than two Author	14	20.90
	Total Number of articles	67	100.00

Collaborative authorship tendency is generally found more in science and technology disiplines. As LIS is a professional work and library work is a team work , therefore experiences which are depicted in the article may be of a team comprising of two professionals. Table No. 2 shows joint authorship trend. From the table it can also be observed that , 66 % articles are having joint authorship.

1.2 Working Institute of Joint Authors

Data in the Table No. 3 indicate that 44 articles were written by Joint authors. In some cases authors are working in one Institute .Whereas some of the joint authors are working in different institute. Efforts are made to see how many joint authors are colleagues.

Table 3: Working Institute of Joint Authors

Sr.No.	Working area (Institute) of joint author	No. of articles	Percentage (%)
1	Same Institute	18	40.90
2	Different Institute	26	59.09
	Total	44	100.00

It can be observed from above data that there are more number of authors working in different institute i.e. 26 authors (59.09 %) out of 44 articles published on joint authorship basis than authors working in same institute i.e. 18 articles (40.90 %).

1.3 Analysis by Designation of Authors

Papers of 126 authors were included in proceeding. These authors having different capacities in library and information science field from different institutions. In order to see which designation represents more in contribution of papers. Data is further analysed by designation. Intention of the present study is to see whether teaching LIS professionals contribute more or LIS professionals those who are working in the libraries contribute more. The details are shown in Table No. 4. It can also be observed that 29.34 % authors who were Professors, Readers, Lecturers and MLIS students are from teaching departments and 41.21 % authors are working Librarians and other scientific field of LIS. However, it also indicates that 29.36 % authors were not mentioned their designation in the said articles.

1.4 Institution wise Analysis of Authors

Efforts were also made to see the affiliated institutions of 126 authors, so as to know the institutions from where the papers were received for the proceedings of ILA.

Indian Library Association having all types of library membership. But it was observed from the Table 5 that authors from academic institutions are more. Public library professionals should not be attracted towards ILA activities. The reasons for not participation by public libraries might be due to

1. Lack of qualified librarian and other staff.
2. Poor financial conditions of public library.
3. Mostly public library work is run in regional language but ILA is a National Level Association and performs all activities in English and Hindi language only.
4. Due to lack of professional qualification and poor financial condition of staff working in public library are less inclined towards research activities.

Table 4: Designation of the contributors

Sr. No.	*Designation*	*No. of authors*	*%*
1	Librarian	23	18.25
2	Deputy Librarian	1	00.79
3	Assitant Librarian	16	12.69
4	Senior Library Assitant	02	01.58
5	Library Assitant	02	01.58
6	Technical Assitant	01	00.79
7	Documentation officer	02	01.58
8	Director	02	01.58
9	Sr. Manager LIS	02	01.58
10	Assitant Manager LIS	01	00.79
11	*Lecturer*	*08*	*06.35*
12	*Reader*	*05*	*03.96*
13	*Associate Professor*	*01*	*00.79*
14	*HOD .LIS*	*12*	*09.52*
15	*Scientist LIS*	*05*	*03.96*
16	*Research Scholler*	*06*	*04.76*
17	**Not Mentioned**	**37**	**29.36**
	Total	**126**	**100.00**

Table 5: Institution-wise distribution of authors

-Sr. No	*Type of Institute / Organisation*	*No. of authors*	*%*
1	Universities	43	34.13
2	Department of LIS	21	16.67
3	Colleges	22	17.46
4	Research Institute	21	16.67
5	Institutions	17	13.49
6	School Library	02	01.59
7	Public Library	00	00.00
	Total	126	100.00

Table 6: Geographical Distribution of Authors

Sr.No.	State	No. of authors	%
	North India	**58**	**46.03**
1	New Delhi	33	26.19
2	Punjab	05	3.97
3	Haryana	06	4.76
4	West Bengal	04	3.17
5	Uttaranchal	04	3.17
6	Uttarpradesh	05	3.97
7	Assam	01	0.79
	Central India	**30**	**23.81**
8	Madhya Pradesh	04	3.17
9	Rajasthan	14	11.11
10	Maharashtra	12	9.52
	South India	**38**	**30.16**
11	Karnataka	26	20.63
12	Andhara Pradesh	07	5.56
13	Tamil Naidu	05	3.97
	Total	**126**	**100.00**

Table 6 reveals that maximum 58 (46.03 %) authors are from North India followed by South India 38 (30.16 %). It can be also observed that all contributors are from 13 States of India.

The results of the analysis show that papers from North India are more in numbers followed by South India. It is found that there are many number of state in India from which library professionals did not contributed their articles in ILA proceeding .

2. CONCLUSION

From the study following were the major findings leading to concluding remark.

1. Wide publicity of conference must be undertaken in regional languages also for encouraging representation from all the States
2. As Hindi is a National Language conference and working should be in Hindi. If possible regional Language wise papers may be accepted and it's presentation in the con-ference can be made by parallel Language wise technical sessions.
3. ILA should undertake measures to motivate library professionals for research activity.
4. Theme of the ILA conference should be such that it should be applicable to all types of libraries so that professionals of other libraries could share their views.
5. Contribution of working LIS professionals is observed more than teachers in LIS. This might be because of teachers are less in number as compared to the working professionals.

Determining and Evaluation of Information Needs : A Critical Approach in the Knowledge Society

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Abstract: The aim of this paper is to attempt to reduce this confusion by devoting attention to the definition of some concepts and by proposing the basis for a theory of the motivations for information-seeking behaviour. States factors affected of human information needs. Graphically represent the formal step-by-step procedure, which can be adopted to study the information needs of a majority of users is proposed in this paper. The paper concludes with the role of library and information centres enabling identification of the strategic policy to meet the needs of the potential users to achieve competitive advantage.

Keywords: Information Needs; Human Information Seeking Behaviour; Information Exchange; Physiological Needs; Cognitive Needs; Industrial Society; Information Society; Knowledge Society; Vertical Information Systems; Slack Resources

1. INFORMATION BEHAVIOUR AND INFORMATION NEEDS

The 'information' and 'need' in 'information need' are inseparable interconnection. Information need is an individual/group's desire to locate and obtain information to satisfy a conscious/unconscious need. Human information behaviour is the totality of behaviours (active/passive) that people engage in to gain access to, organize and use, information. Thus, it will include not only pro-active steps to gain access but also the passive reception of information, which then, or later, turns out to be of use (Wilson, 1989)

In day-to-day work, lack of self-sufficiency constitutes information needs. This information needs represent gaps in the current knowledge of the user. The purpose of a library or an information system is of course to fulfill some needs for documents and information for users/potential users. Such needs may, be related to educational activities, to research activities, to professional activities, to recreation activities, to cultural activities or to personal development. Apart from the expressed/articulated needs, there are unexpressed needs, which the user is aware of but does not like a need is specific, and generally time bound either immediate/deferred to express. But the information services provider may be able to bring to light these needs.

1.1 Factors Affected by Information Needs

According to Crawford (1978), information needs depend on:

- Work activity;
- Discipline/ Field / Area of interest;
- Availability of facilities;
- Hierarchical position of individuals;
- Motivation factors for information needs;
- Need to take a decision;
- Need to seek new ideas;
- Need to validate the correct ones;
- Need to make professional contributions;

- Need to establish priority for discovery etc.

Information needs are affected by a variety of factors such as:

- The range of information sources available;
- The uses to which the information will be put;
- The background, motivation, professional orientation and other individual characteristics of the user;
- The social, political, economic, legal and regulatory systems surrounding the user; and
- The consequences of information use (Paisley, 1968).

Information needs identification is a complex process. Some of the factors adding to the complexity are:

- Same information is perceived by different users differently as their information need. (Value system of users differ due to the nature of work and it affects factors such as the information products and services).
- Researchers need original documents whereas planners need digests of 'point of view'/opinions;
- Information is put to different uses (R & D personnel, Application developers and Technicians all put information to different uses);
- Need is satisfied by having access to the identified information in a particular package and form, and at a suitable time;
- The flow of information and channels of communication are complex and add to the complexity; and
- Individual preferences and behavioural aspects add a further dimension.

Apart from the complexities mentioned above, there are problems due to individual behaviour too:

- A user may not like to reveal his/her need as s/he may like to show that s/he is above (any) requirements and that s/he knows his/her sources. To divert or mislead s/he may give or just because some one else is getting an information s/he may give a pseudo need to receive the same information.
- Further, an interaction of all the above factors makes the process of identifying information needs akin to carrying out an investigation or detective work, and is one of the 'grey areas' of research in Library and Information Science for the past few decades..

It is important that need is not mistaken for demand. The demand for information or documents may be low, for example, the users see the library as inaccessible. Still, the needs exist. An information need may be more or less recognized by the users. This differentiation between "a demand" and "a need" is well recognized in the literature of Library and Information Science (LIS). If we replace the term "information needs" with the term "information-seeking behavior" we might be able to study this behavior, but we still face the problem to determine whether this behavior is an expression of needs, or just expressions of demands? (Devadason and Lingam, 1996).

2. SCOPE OF THE PAPER

There have been several studies of users, information needs, information seeking behaviour and information use, and the number of publications in this area is estimated to be more than 2000 with several review articles. However, it has proved to be a difficult area of knowledge though several

methods have been proposed. In order to identify information needs to have some insight into the actual information needs one should adopt various methods to gather information on the various factors that influence the information needs. No single method or tool will serve entirely. A careful selection and blending of several techniques depending on the user whose need is being studied is necessary. A formal procedure which can be adopted to the study of the information needs of a majority of users is proposed in the following sections. Besides gathering and recording the information needs, careful analysis is to be made to distil actual needs from the data gathered. To derive the advantages of a combination of 'a priori' and 'pragmatic' approaches, the methodology proposed in the paper involves the conceptual and empirical survey of user information needs.

1) Study of subject(s) of interest to the organisation/User(s);
2) Study of the organisation and its environment;
3) Study of the immediate environment of the User(s);
4) Study of the User(s);
5) Formal interview;
6) Identification and recording of information needs;
7) Analysis and refinement of the identified information needs.

2.1 User Studies

Figure-1 presents a way of thinking of the field, 'user studies'; its aim is not to 'model' information-seeking behaviour but to draw attention to the interrelationships among concepts used in the field. It suggests that information-seeking behaviour results from the recognition of some need, perceived by the user. That behaviour may take several forms: for example, the user may make demands upon formal systems that are customarily defined as information systems (such as libraries, on-line services, or information centres), or upon systems which may perform information functions in addition to a primary, non-information function (such as estate agent's offices or car sales agencies, both of which are concerned with selling, but which may be used to obtain information on current prices, areas of 'suitable' housing, or details of cars that hold their secondhand value).

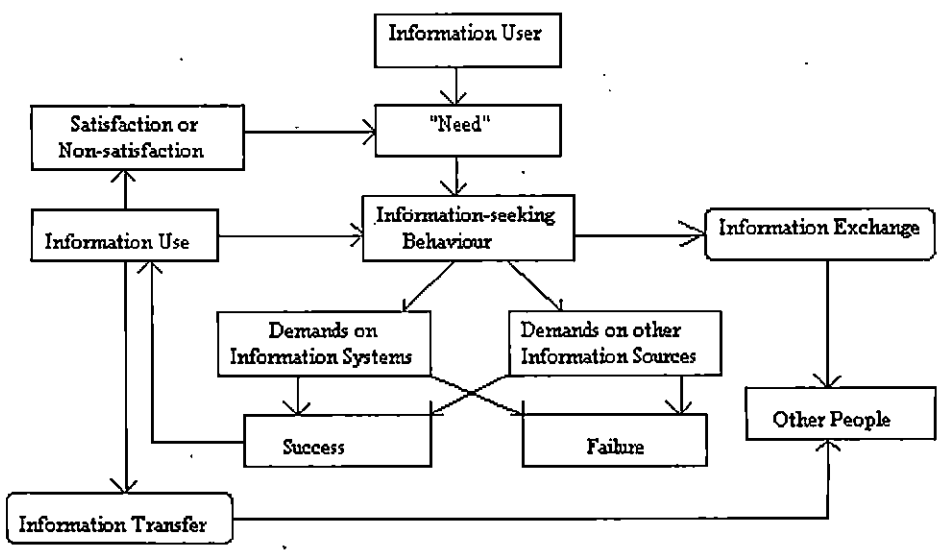


Fig. 1: a model of information behaviour

Alternatively, the user may seek information from other people, rather than from systems, and this is expressed in the diagram as involving 'information exchange'. The use of the word 'exchange' is intended to draw attention to the element of reciprocity, recognized by sociologists and social psychologists as a fundamental aspect of human interaction (Gouldner, 1960). In terms of information behaviour, the idea of reciprocity may be fairly weak in some cases (as when a junior scientist seeks information from a senior but hierarchically equal colleague) but in other cases may be so strong that the process is inhibited, as when a subordinate person in a hierarchy fears to reveal his ignorance to a superior (Jackson, 1959).

There is another confusion, possibly more basic, in the association of the two words 'information' and 'need'. This association imbues the resulting concept with connotations of a basic 'need' qualitatively similar to other basic 'human needs'. However, if we examine the literature on human needs we find that this concept is divided by psychologists (Eysenck, 1972) into three categories:

- Physiological needs, such as the need for food, water, shelter etc.;
- Affective needs (sometimes called psychological or emotional needs) such as the need for attainment, for domination etc.;
- Cognitive needs, such as the need to plan, to learn a skill etc.

It will be quickly recognized that these three categories are interrelated: physiological needs may trigger affective and/or cognitive needs; affective needs may give rise to cognitive needs; and problems relating to the satisfaction of cognitive needs (such as a failure to satisfy needs, or fear of disclosing needs) may result in affective needs (for example, for reassurance). These interrelation-ships are shown in Figure-2, which suggests that, as part of the search for the satisfaction of these needs, an individual may engage in information-seeking behaviour. Indeed, it may be advisable to remove the term information needs from our professional vocabulary and to speak instead of information-seeking towards the satisfaction of needs (Wilson, 1981).

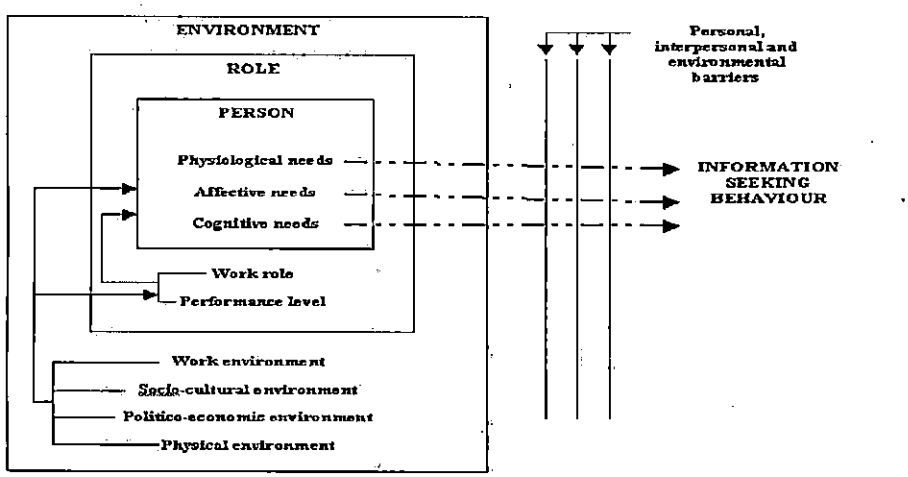


Fig. 2: Information needs and seeking

3. LITERATURE REVIEW

Robert S. Taylor (1962): The concept of information needs was coined by an American information scientist Robert S. Taylor in his article 'The Process of Asking Questions" published in American Documentation (Now is Journal of the American Society of Information Science and

Technology). In this paper, Taylor attempted to describe how an inquirer obtains an answer from an information system, by performing the process consciously or unconsciously; also he studied the reciprocal influence between the inquirer and a given system.

According to Taylor, information need has four levels:

1. The conscious and unconscious need for information not existing in the remembered experience of the investigator. In terms of the query range, this level might be called the "ideal question" — the question that would bring from the ideal system exactly what the inquirer, if he could state his need. It is the actual, but unexpressed, need for information
2. The conscious mental description of an ill-defined area of in decision. In this level, the inquirer might talk to someone else in the field to get an answer.
3. A researcher forms a rational statement of his question. This statement is a rational and unambiguous description of the inquirer's doubts.
4. The question as presented to the information system.

   There are variables within a system that influent the question and its formation. Taylor divided them into five groups: general aspects (physical and geographical factors); system input (What type of material is put into the system, and what is the unit item?); internal organization (classification, indexing, subject heading, and similar access schemes); question input (what part do human operators play in the total system?); output (interim feedback).

Herbert Menzel (1966): Herbert Menzel preferred demand studies to preference studies. Requests for information or documents that were actually made by scientists in the course of their activities form the data for demand studies. Data may be in the form of records of orders placed for bibliographics, calls for books from an interlibrary loan system, or inquires addressed to an information center or service. Menzel also investigated user study and defined information seeking behaviour from three angles:

1. When approached from the point of view of the scientist or technologists, these are studies of scientists' communication behaviour;
2. When approached from the point of view of any communication medium, they are use studies;
3. When approached from the science communication system, they are studies in the flow of information among scientists and technologists.

William J. Paisley (1968): William J. Paisley (moved from information needs/uses toward strong guidelines for information system. He studied the theories of information-processing behavior that will generate propositions concerning channel selection; amount of seeking; effects on productivity of information quality, quantity, currency, and diversity; the role of motivational and personality factors, etc. He investigated a concentric conceptual framework for user research. In the framework, he places the information users at the centre of ten systems, which are:

1. The scientist within his culture.
2. The scientist within a political system.
3. The scientist within a membership group.
4. The scientist within a reference group.
5. The scientist within an invisible college.

6. The scientist within a formal organization.
7. The scientist within a work team.
8. The scientist within his own head.
9. The scientist within a legal/economical system.
10. The scientist within a formal.

Devadason and Prataplingam (1996): F.J.Devadason and Prataplingam have proposed a methodology for identification of information needs. According to them the "information needs identifier" should study, prepare and equip him/her-self thoroughly to perform the task of identifying information needs. They have suggested a formal step-by-step procedure, which can be adopted to study the information needs of a majority of users applicable to a majority of situations. The major steps are as follows:

1) Study of subject(s) of interest to the organization/ Client(s)
2) Study of the organization and its environment
3) Study of the immediate environment of the Client(s)
4) Study of the Client(s)
5) Formal interview
6) Identification and recording of information needs
7) Analysis and refinement of the identified information needs.

4. ROLE OF THE LIBRARY/INFORMATION CENTRES

As we move from a concept of the information society on to a concept of a knowledge society, the role of libraries must undergo similar changes of priority. The main contentions of the article are-

First, that libraries must move from defining their professional role in terms of providers of information literacy on to a role as multimodal knowledge centres encompassing information as well as entertainment, retrieval as well as production.

Second, librarians need to redefine their role in the physical library as facilitators of multimodal literacy and do so in close cooperation with other partners advancing civic society.

Table 1: Library innovation and socio-cultural conditions

	Industrial society	*Information society*	*Knowledge society*
Aim of library use	Cultural discrimination (taste)→ Personal relevance of cultural choice	Universal and free access to information → Information literacy	Universal and free use of information and fiction→ Multimodal literacy
Definition of library/librarian	Cultural custodian →Cultural guide	Information disseminator	Knowledge facilitator
Definition of material/content	Material entity, physical artifact	Non-material process → Effective, reliable information processing	Material artifacts and non-material processes → Information and fiction
Definition of user	Receiver of choice →cultural consumer	Information producer and evaluator	Knowledge producer, cooperator and cultural citizen

As is well-known, libraries have developed historically in tandem with the industrial society, and their formation is mostly based on enlightenment ideals of freedom of expression and of universal access to information and works of imagination. Article 19 in the Universal Declaration of Human Rights from 1948 is an eloquent and unique expression of these ideals stating that "everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers." Libraries in industrial societies serve to remedy the scarcity of information and (quality) entertainment and to secure universal access.

The definitions of libraries and of library professional change accordingly. The enormous increase in Internet-based communication serves to shift attention to the virtual, rather than the physical library. Digital reference services, free access to large-scale data banks and secure retrieval become vital areas of professional development, and there is certainly more to come in this decisive domain of innovation. The library professional's traditional role as 'cultural custodian' or, in the 1980s as 'cultural guide', is downplayed in favour of the library professional's function as effective information disseminator assisting in the user's development of information literacy. Focus is on developing user-friendly information searches that gradually become more and more attuned to actual problems and activities rather than stand-alone tools.

From the mid-1990s on, 'the knowledge society' (Stehr, 1994) begins to compete with 'the information society' as a pervasive term in public discourse. While the term information society focuses on the raw materials so to speak ('information'), the term knowledge society serves to emphasize the various menus ('knowledge') that may result from people's handling of the raw materials. The change in concepts thus reflects a transformation in societal definitions of the fundamental levers of social development and of the competences necessary to bring about such developments.

5. CONCLUSION

According to the Carnegie Mellon School and its followers, information management, i.e., the organization's ability to process information, is at the core of organizational and managerial competencies. Consequently, strategies for organization design must be aiming at improved information processing capability. Galbraith (1977) has identified five main organization design strategies within two categories— increased information processing capacity and reduced need for information processing.

1. Reduction of information processing needs

- Environmental management
- Creation of slack resources
- Creation of self-contained tasks

2. Increasing the organizational information processing capacity

- Creation of lateral relations
- Vertical information systems

Environmental management. Instead of adapting to changing environmental circumstances, the organization can aim at modifying its environment. Vertical and horizontal collaboration, i.e. cooperation or integration with other organizations in the industry value system are typical means for reducing uncertainty. An example for reducing uncertainty in the relation with the prior or demanding stage of the industry system is the concept of Supplier-Retailer collaboration or Efficient Customer Response.

Creation of slack resources. In order to reduce exceptions, performance levels can be reduced, thus decreasing the information load on the hierarchy. These additional slack resources, required to reduce information processing in the hierarchy, are representing an additional cost to the organization and the choice of this method is clearly depending on the alternative costs of other strategies.

Creation of self-contained tasks. Achieving a conceptual closure of tasks is another way of reducing information processing. In this case, the task-performing unit has all the resources required to perform the task. This approach is concerned with task de-composition and interaction between different organizational units, i.e. organizational and information interfaces.

Creation of lateral relations. In this case, lateral decision processes are established that cut across functional organizational units. The aim is to apply a system of decision subsidiarity, i.e. to move decision power to the process, instead of moving information from the process into the hierarchy for decision-making.

Investment in vertical information systems. Instead of processing information through the existing hierarchical channels, the organization can establish vertical information systems. In this case, the information flow for a specific task (or set of tasks) is routed in accordance to the applied business logic, rather than the hierarchical organization.

Following the lateral relations concept, it also becomes possible to employ an organizational form that is different from the simple hierarchical information. The Matrix organization is aiming at bringing together the functional and product departmental bases and achieving a balance in information processing and decision making between the vertical (hierarchical) and the horizontal (product or project) structure. The creation of a matrix organization can also be considered as management's response to a persistent or permanent demand for adaptation to environmental dynamics, instead of the response to episodic demands.

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Implementation of TQM in Libraries

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Abstract: Total Quality Management is now on influential concepts. It is a Japanese concept of quality and statistical measurement technique which focuses on effort of all employees on a day to day basis towards improving and maintaining the quality of the company's products and services. This paper describes the various issues involved with the implementation of the TQM in libraries. Explains the objectives, quality services, TQM techniques and implementation of TQM in libraries for better service.

Keywords: Total Quality Management; TQM; Libraries.

1. INTRODUCTION

Libraries and information Centers have become increasingly involved in management practices, as pressures from their parental bodies, impel them to justify their services relation to the user needs. Since most libraries spend more than half of their budgets on staff salaries, there is growing concern to get the most value from this expensive resource. It means giving careful and well informed attention to be given on each stage of staff management.

The total quality is now the fundamental business principals everywhere in the organizations anyone who ignores quality today does so the great jeopardy to his or her business. In the 1980s, many commercial organizations adopted quality processes to improve their competitive users and a number of different approaches which are now in use. Thus, one of the key developments in the last two and half decades has been the increased interest in quality and quality assurance.

Definition of Quality

The Random House Dictionary defines 'Quality' of a person or a thing as a characteristic, innate or acquired, which, in particular, determines the nature and behavior of the person or thing. The synonyms of 'Quality' are trait, character, feature, attribute, property, etc. In general usage, most people have too on arrow a perspective of the meaning of the word 'Quality'. They either associate poor 'Quality' with defects in products, such as scratches, cracks, missing parts, and so forth or of persons in their general conduct or behaviour quality with the opposite of the above attributes with reference to a product or a person.

Towards Total Quality Management

Professor Karou Ishikawa is said to be the pioneer in developing a new system of management that combines all the beneficial ingredients of both systems viz, craftsmanship and scientific management but avoiding all their disadvantages.

Taylorism (Scientific management) has never been challenged in the Western World because it has been assumed that Taylorism and Craftsmanship are mutually exclusive and therefore incompatible, Ishikawa's effort was to introduce a hybrid variety of management, by bringing the craftsmanship

element back to groups of people rather than the individuals; yet retaining all the plus points of Taylorism. This is the essence of Total Quality System.

Total Quality is a very human concept. It is based on several human feelings and behaviour such as the following:

- Recognition of achievement is very important to people.
- People like, and feel a need, to share their experience;
- Group achievements have the effect of group bonding and creating a sense of belonging;
- Success breeds success – people are encouraged by achievement and feel a need to equal or surpass their best;
- People want to be listened to and to feel important;
- No one wants to feel like an extension of a machine or a desk;
- Everyone wants to have an opportunity for continuous self-development and self respect;
- If you treat people like responsible human beings they are likely to behave like them.

These principles are absolutely fundamental to achievement of total quality and are almost the opposite of Taylorism and Scientific Management.

2. TOTAL QUALITY MANAGEMENT (TQM)

Total Quality Management is now on influential concepts. It is a Japanese concept of quality and statistical measurement technique which focuses on effort of all employees on a day to day basis towards improving and maintaining the quality of the company's products and services. Its aim is to ensure complete customer satisfaction. Thus matters of quality have been at the forefront of changes in higher education also.

Total Quality Management (TQM) is focused on the requirements of the customer. A library patron or user is a customer. He or she is demanding a service and expects that service. Total Quality Management offers an approach for an organization to design processes, policies, and jobs so that they are the best, most effective methods for serving users' needs, eliminating inefficiencies and assuring quality service, TQM is an important strategic management tool and a systematic approach with strong internal and external customer orientation. "Quality as a management tool especially for non-profit organizations like libraries." The service is defined by library users in the TQM context. Since user's need will continue to change, quality service will require a continuous improvement process Libraries will continue to :

- Identify customers' – who matters?
- Identify customer expectations or needs – what do they want?
- Translate customers expectations into operational processes – what do we need to do to meet users' expectations?.
- Decide on how to measure services – how will we know how we are doing ?
- Conduct evaluation of services based on established performance measures – what processes should we continue or change?

3. OBJECTIVES OF TOTAL QUALITY MANAGEMENT (TQM)

An organization which adopts the philosophy of total quality, and its principles, is to be guided by a few general / principal objectives, in addition to its own specific ones. These are :

- Continuous improvement of the organization which must be equal to or greater than that of any competitor :
- Continuous and relentless cost reduction;
- Continuous and relentless quality improvement;
- Total participation i.e. Creating an organization whereby everyone is working towards making the organization the best in its area of activity, and to capitalize on the sense of achievement and working in a world-class organization.

4. TOTAL QUALITY MANAGEMENT IN LIBRARIES

In the 1950's, the Japanese asked W. Edwards Deming, an American statistician and management theorist, to help them improve their war torn economy. By implementing Deming's principles of total quality management (TQM), Japan experienced dramatic economic growth. In the 1980s, when the United States began to see a reduction in its own world market share in relation to Japan, American business rediscovered Deming, Quality management experts, Joseph Juran and Philip Crosby, also contributed to the development of TQM theories, model, and tools TQM is now practiced in business as well as in government, the military, education, and non-profit organizations including libraries (Jurow & Barnard, 1993).

TQM is a system of continuous improvement employing participative management and centered on the needs of customers" (Jurow & Barnard, 1993). Key components of TQM are employee involvement and training, problem-solving teams, statistical methods, long-term goals and thinking, and recognition that the system, not people, produces inefficiencies. Libraries can benefit from TQM in three ways : breaking down interdepartmental barriers, redefining the beneficiaries of library services as internal customers (staff) and external customers (patrons); and reaching a state of continuous improvement (Jurow & Barnard, 1993).

A library should focus ion providing the best services possible, and be willing so change to serve its customers. To determine if changes need to be made, a library administrator might ask: What are our niche markets? What do the customers come in for? How can I look at the efficiency of my library? How do we serve the current customers that exist today? (Total Quality Management, 1995). First learn about the customer, and then solve the problems.

4.1 Steps to Total Quality Management

Based on his work with Japanese managers and others, Deming (1986; Walton, 1986) outlined 14 steps that managers in any type of organization can take to implement a total quality management program.

- Create constancy of purpose for improvement of product and service. Constancy of purpose requires innovation, investment in research and education, continuous improvement of product and service, maintenance of equipment, furniture and fixtures, and new aids to production.
- Adopt the new philosophy. Management must undergo a transformation and begin to believe in quality products and services.

- Cease dependence on mass inspection. Inspect products and services only enough to be able to identify ways to improve the process.
- End the practice of awarding business on price tag alone. The lowest priced goods are not always the highest quality, choose a supplier based on its record of improvement and then make a long – term commitment to it.
- Improvement constantly and forever the system of product and service. Improvement is not a one-time effort; management is responsible for leading the organization into the practice of continual improvement in quality and productivity.
- Institute training and retaining. Workers need to know how to do their jobs correctly even if they need to learn new skills.
- Institute leadership. Leadership is the job of management. Managers have the responsibility discover the barriers that prevent staff from taking pride in what they do. The staff will know what those barriers are.
- Drive out fear. People often fear reprisal if they "make waves" at work. Managers need to create an environment where workers can express concerns with confidence.
- Break down barriers between staff areas. Managers should promote teamwork by helping staff in different areas / departments work together. Fostering interrelationship among departments encourages higher quality decision – making.
- Eliminate slogans, exhortations, and targets for the workforce. Using slogans alone, without an investigation into the processes of the workplace, can be offensive to workers because they imply that a better job could be done. Managers need to learn real ways of motivating people in their organizations.
- Eliminate numerical quotas. Quotas impede quality more than any other working condition; they leave no room for improvement. Workers need the flexibility to give customers the level of service they need.
- Remove barriers to pride of workmanship. Give workers respect and feedback about how they are doing their jobs.
- Institute a vigorous program of education and retaining. With continuous improvement, job descriptions will change. As a result, employees need to be educated and retrained so they will be successful at new job responsibilities.
- Take action to accomplish the transformation. Management must work as a team to carry out the previous 13 steps.

The more common approach to developing quality in libraries and information units has been the adoption of Total Quality Management or TQM as it is better known. TQM involves staff understanding their role in delivering quality through clarifying what is expected of them. In addition, it is important to foster a management approach which empowers and motivates. Andrew Forrest (1994), describes the difference between an ordinary approach to service where staff have no authority to make decisions and the TQM approach where staff can do anything (within reason) to please the customer.

4.2 Implementing TQM Techniques

Total Quality Management (TQM) as a management tool needs to radically rethink the way in which a library is organised and performs its functions. With its emphasis on meeting users' needs.

TQM is seen as a commitment to service with a flexible and future – oriented approach to management. Susan and Barnard presents a model for the implementation of TQM in the library setting. It outlines a ten-step process divided into four stages shown as fig. 2. The approach is a flexible one that can be applied in different ways to a variety of situations depending on the level of support for implementing TQM both within and outside the library.

Phase 1

The activities covered in Phase one are quite useful to arrange a seminar exploring the implications of current technological developments and other societal changes that enhance the growth of the library community.

Phase 2

Phase two emphasis on organizing quality once the commitment to TQM and the decision on the TQM methodology and structure is made. Quality / Service awareness, various aspects of library automation training should be given to all employees.

Phase 3

Phase three involves an extensive evaluation of current work processes and the relationship of these processes to customer needs and expectations. Laying heavy emphasis on team activity, team members will need extensive training on the customer service dimension of the quality process including how customers judge services (e.g., reliability, responsiveness, assurance).

Phase 4

In the process of expansion and integration (Phase four), training can be extensive. Some employees even may need training even in new job skills as a result of changed work processes particularly when a manual library is being converted into an automated library.

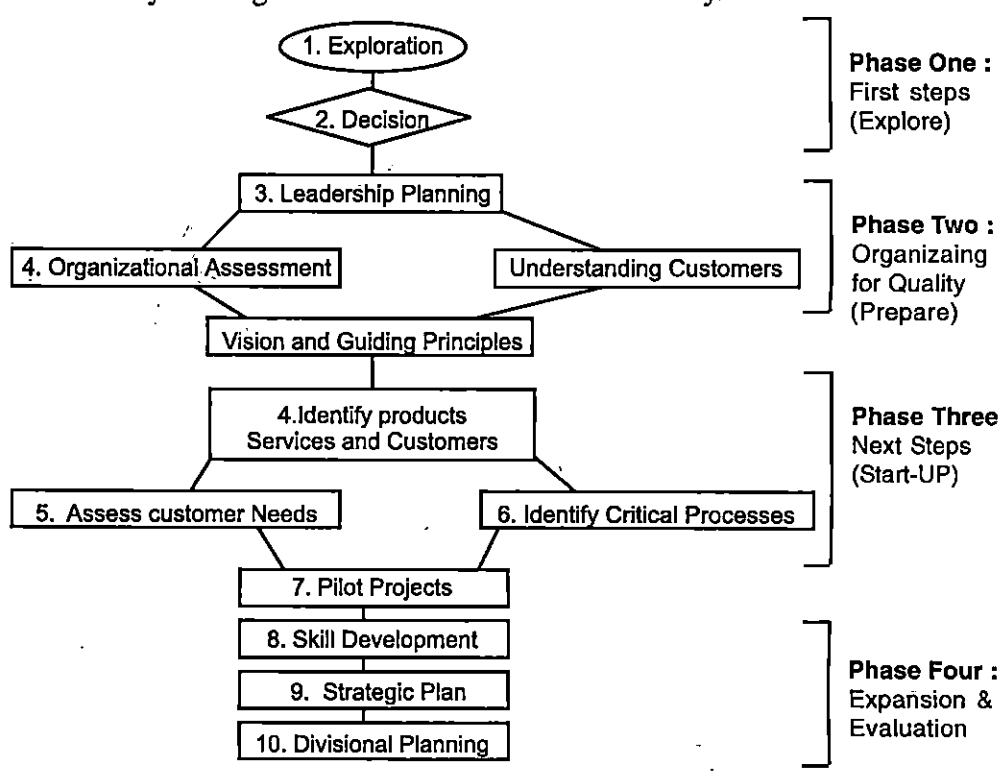


Figure 2. Total quality Management : Library Implementation Model

4.3 Quality Library Service

Library and information managers are how under considerable pressure to deliver quality services. This arises out of an increased awareness of the cost of services in all sectors and a need to demonstrate value for money. Quality services are not a luxury, they are essential for our survival. In addition, the quality approach should save money by eliminating mistakes and leading to the adoption of the most efficient and effective processes. It should also provide better clarity about what and is not, expected from the service, helping us to anticipate and avoid problems and giving us better relationships with our customers.

As individuals, developing quality processes should give us more control over our work and, therefore, improved time management. It cab also provide more job satisfaction and opportunities for personal development. Finally, external validation, e.g. through recognition by professional or funding bodies or public accreditation through the granting of the Charter Mark or other quality award, can be motivating for staff and demonstrates to your 'public' that the service you provide is recognized as being excellent.

4.4 Benefits of TQM

What is attempted in the whole process of TQM is to introduce a new cultural change, through changing the style of people management which is likely to bring about greater participation from the employees who would work with the management to achieve the organization goals and objective. Management rewards comes from:

- Work itself becomes more interesting through greater involvement of employees;
- Increase in general productivity ;
- Lower absenteeism because of greater job interest and satisfaction to employees :
- Fewer grievances among the employees;
- All round greater team spirit.

Top management must convey to middle management that it believes in TQM approach with the design of a deliberate policy. Middle management are expected to conduct their affairs keeping TQM policy in view, conveying the decision to supervisors. Once the entire organization is geared to the change, the new culture would get engrained in the organization leading to success.

4.5 Barriers and Problems

A number of barriers to the implementation of TQM has been encountered in all types of organizations, including libraries. Some of them are listed below (Miller and Stearns).

1. The view that this is only another management fad of the day
2. Management's fear of the loss control
3. Employee reluctance to recommend changes because of fear of the management
4. Business and industrial background of TQM might not lend itself to the non-profit Sector, including libraries.
5. TQM requires a long-term investment of time over several years as processes are analyzed and an organization's culture is changed. This can cause resistance and Other difficulties in these days of increasing financial and other pressures.

What are the problems in implementing TQM? Problems can exist in establishing a good relationship between management control and promoting employee Empowerment. Another problem encountered

is related to TQM statistical tools. An Inappropriate emphasis on these tools in complex service organizations such as libraries May result in TQM and its goals being regarded as unattainable.

5. CONCLUSION

Libraries are the ideal places to implement TQM. They are service organizations dedicated to their customers, the patrons. By formulating a strategic plan, and following it with a commitment to continuous quality improvement, library managers can transform and improve their organizations. The success of TQM will vary from library to library as each library is different from the others. The realities of the current library situation indicate that quality improvement is essential not only for survival but for facing major changes and growth required for the libraries of today and tomorrow.

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Knowledge for All: Role of Libraries and Information Centres

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Abstract: Library and Information Centers are the places where knowledge sources are collected, processed, organized, retrieved and disseminated according to the requirements of the users. Knowledge and the development of the knowledge in Ancient to recent years has become the key concern for Librarians and Library and Information Science field. This paper will review the development of knowledge and the role of librarians / libraries and information centers. The new role of librarians / libraries in the 21st century needs to be as a learning and knowledge centre for their users as well as the intellectual common for their respective communities. People and ideas interact in both the real and virtual environments to expand learning and facilitate the creation of new knowledge. It will also examine the role of librarians / libraries and information centers in the utilization of the knowledge to its users in the digital and knowledge age should be in charge of knowledge in their respective organizations to facilitate knowledge creation. Also study the focus on putting knowledge to use by society, explaining the efforts put in the professionals and various steps from reception of knowledge to its final utilization by their users.

Keywords: Role of Library and Information Centres, Knowledge for all

1. INTRODUCTION

The man is a thoughtful animal. Various types of thoughts and ideas are created in his mind; hence human mind is a generator of ideas. These thoughts and ideas are based on certain facts. These facts are derived by continuous observances and experiences. When these facts hold the test of time, they become data. When these date are arranged in an organized manner and presented, told or passed on to some one, become knowledge.

Knowledge is the organized body of information or the comprehension and under standing, consequent on having acquired on body of facts. A book General Knowledge is the title of a Document which contains date and information about selected topics which would be useful to students who appearing Union Public Service Commission Competitive Examination. Similarly, we often refer to library as a store house of knowledge, meaning thereby, that a library is stores of documents which contain information and knowledge.

At present libraries are define as a house of knowledge. The libraries actively engaging in their service with need based services. Today libraries are completely plays as a mediator between knowledge containers and knowledge seeking. The librarian uses the term knowledge in his or her professional activities and refers to the recording of human knowledge in books, journals and other media. While the world is changing in the new knowledge and digital age, libraries of all types are undergoing drastic changes also. The new role of librarians / libraries in the 21st century needs to be as learning and knowledge centre for their users. As a learning organization, libraries should provide a strong leadership in knowledge management. Unlike those organization whose goal for knowledge management is for competitive advantage, most public, academic, and research libraries, with the exception of company libraries, which may be known or called corporate libraries, special libraries, or knowledge centers have a different orientation and value.

Knowledge can be broadly divided into personal knowledge and social knowledge. Personal knowledge is the knowledge of the mind of an individual and as such is available only to him/her or through him/her to others if communicated. Social knowledge is the knowledge possessed collectively by a society or a social system. It is supposed to be freely and equally available to all the members of the society. Libraries and Information Centre provide this kind of knowledge. It must be, however, stated here that these two kinds of knowledge are not mutually exclusive. Social knowledge is an essential source of personal knowledge and it is from personal knowledge that most of social knowledge is built.

2. OBJECTIVE OF THE STUDY

The objective of the study dealing with knowledge in different dimensions with a particularly focus on Libraries and Information Centers.

- Study the structure and development of knowledge
- Study the sociology of knowledge in its different aspects related with libraries and information centers
- Study about knowledge generation, exchange and utilization in a libraries and by the librarians
- Studies the value and utilization of knowledge as the principal resource to sustain growth and development of a society
- Study focus on putting knowledge to use by society, explaining the efforts put in by professionals
- Study the various steps from reception of knowledge to its final utilization by the users.

3. DEFINITION

There is no single agreed definition of knowledge presently, nor any prospect of one, and there remain numerous competing theories. Knowledge acquisition involves complex process, perception, learning, communication, association and reasoning. The term knowledge is also used to mean the confident understanding of subjects with the ability to use it for a specify purpose if appropriate.

Knowledge can be defined as the management of creating, sustaining, applying, and renewing knowledge resources of an organization including its relationship with customers and supplier's i.e. users and library and information science professionals.

Knowledge is define variously as i) Expertise, and skills acquired by a person through experience or education ; the theoretical or practical understanding of a subject, ii) What is known in a particular field or in total ; facts and information or iii) Awareness or familiarity gained by experience of a fact or situation. Philosophical debates in general start with plato's formulation of knowledge as "justified true belief".

"Knowledge is the small part of ignorance that we arrange and classify" - Ambroes Bierce (1842-1914).

4. HISTORY

History of man on earth is the history of knowledge. Right form the primitive society till today, there has always been a constant social pressure as well as an urge to find out something new, i.e. exploring the possibilities of the unknown. Quite a major part of our knowledge today has been the

result of social needs, social forces and human urges. Thus, society has always remained a vital force behind the emergence and development of new aspects of knowledge. Knowledge and society are inter-linked and inter-dependent. The developments in knowledge are closely associated with the developments in the society. The history of the development of society is the history of the development of research as well as of the widening of frontiers of knowledge. Whether the ancient man lived on trees or in caves pertains to the history of the development of the ancient man and his social surroundings.

The next stage was of explorations with an idea to know the people and to explore the unknown and hidden natural resources for the betterment of and improvements in leading a good and comfortable life and finally to know everything about this planet, the earth. Man's single-minded pursuit of this task unleashed a host of immense problems which later on resulted into the formation of new disciplines in knowledge. From the beginning, man started using his mental faculties in expanding the horizons of knowledge, of search and research, either for necessities or comforts or luxuries of life.

Modern man with advanced scientific and technological developments at his disposal has been able to derive and develop arts, artifacts and amenities for a comfortable and luxurious life, still man is not satisfied, not happy at all. Worried all the time, he is leading a life full of mental and physical tensions, it is because, pleasure is different from happiness. The cycle of thought and development of knowledge are the processes, always developing, continuously growing and giving birth to discoveries and inventions, which hold the promise of progress and prosperity.

5. SOURCE OF KNOWLEDGE

The universe of knowledge is multi-dimensional, multi-directional continuum, ever-changing and ever-growing, giving rise to new disciplines and new areas of study. This growth is evident in broad area of knowledge and their sub-divisions; knowledge pertains to this recorded and socialized memory. To know is not sufficient. It is essential for others to know that you know. From the immemorial, man has been recording his ideas, feelings, emotions, sentiments, dreams, convictions and faith, incidents of daily life, and a host of other things in various ways. Man's endeavour has always been a story of struggle for creating new things and conditions which should ensure a better, comfortable and a danger-free life. This process is the pursuit of knowledge is a never-ending phenomenon. An analytical look at the historical account of the emergence of knowledge reveals three ultimate source of knowledge:

1. Dogma
2. Observation
3. Hypothesis / Normative principal

6. STRUCTURE OF KNOWLEDGE

All domain of knowledge have a common structure very much similar to the pattern of the human brain and the way in which brain process information so as to make them the integral part of the knowledge base subjected to frequent revision and updating based on new evidences and experiences. All the traditional knowledge in religion or spirituality, medical care and literature are well structured and presented in a way so that people can easily learn, remember, recollect, revise and use them. By the developing sophisticated computer programs it is possible to study the structure of all such works.

of knowledge and to give mathematical models for them so as to develop algorithms for knowledge processing.

Knowledge can be divided into two parts tacit knowledge and explicit knowledge. Tacit knowledge is the 'know how' acquired by persons. Explicit knowledge is systematically documented records in any kind of format, which guides the users to gain the knowledge and to expand the knowledge base further. Both types of knowledge are important in the library and information community.

7. ROLE OF LIBRARIES AND INFORMATION CENTERS

The Radha Krishnan Commission (1948) has emphasized the importance of academic libraries as under:

"The library is the heart of all the University work; directly so, as regards its research work and indirectly as regards its education work, which derives its life from it."

An important part of work of the library and information professionals lies at the intersection of disciplines in organizing literature search services and other related information storage and retrieval efforts. Studies on knowledge about knowledge give the professional an insight into the disciplines to intuitively work out the strategy for content analysis and synthesis.

The library as an agency for the communication and distribution of knowledge has undergone major changes from ancient times till today. When machines were not used for printing and publishing purpose, the manuscripts used to be stored by the librarians and the users being limited, were not exposed to the public for constant use. With the advancement in the printing technology and in the manufacture of paper the number of printed books and periodicals started increasing and the expansion in education gave further impetus to the community of readers to make maximum utilization of the available reading materials. Thus, the library started developing gradually as a social institution of the people, for the people and by the people, charged with the responsibility to provide informal life long, free, self-education to the masses without any distinction of caste, creed, sex, age, occupation etc. In the twentieth century, the library has occupied a key position with solid base in the society, in the government organizations, in the business sectors, in the industrial units, and research institutions. As a result the modern library is divided into several categories based on the nature of information being disseminated, nature and demands of the clientele and finally the nature of the types of documents dealt with. Hence these are known as i.e. Public, Academic and Special libraries. The public library in the twentieth century occupies a key position in the social and cultural set-up of the community in the developed and the developing nations. The academic libraries deal with the students, research scholars and the faculty, keeping in view their academic, teaching and research needs. The special libraries deal with the highly specialized groups of readers such as business, industrial, newspaper, scientific, medical, agricultural etc.

Library has several forms of documents. Today, we call them as learning resource facilities or Media or Knowledge transfer. We have them in the form of Books, Magazines, Journals, Newspapers, Radio, Television, Microfilm, Micro-fiche, Audio-tape, Video-tape, Laser disk, Compact disk, Computer Software, Computer network, Satellite systems. Education is a process of learning, understanding, applying, and utilizing knowledge for betterment of oneself, other individuals and the society as a whole. It helps to lead better quality of life. Education is a process for thinking, cognition, and acquisition of knowledge. The human society since inception has created, gathered, stored, and disseminated knowledge through a variety of media. Libraries act as harbingers of knowledge gathering and disseminating information to all.

They provide various mechanisms for acquiring knowledge, and become a platform for conducting self-education. Libraries are centers for self-education and self-learning. The functions of a library in response to knowledge can be stated as:

i) Conservation of knowledge resources
ii) Preservation of cultures of different heritage through knowledge media
iii) Information dissemination on a wider scale
iv) Information resource sharing
v) Information resource services
vi) Self-learning and self-education
vii) Social interaction for intellectual and academic activities.

With the dawn of information age, learning society, explosion of knowledge and life-long dynamic self-education, the set of modern characteristics which obtains greater relevance is similarities, supplementary roles, team work, elbow support, technological know how and items of that variety. Library and information people, like teachers, have basically collegial concerns and certain basic similarities of social and intellectual background. Both teachers and information people measure and disseminate knowledge. A successful and growing teacher must have entered into companionship with librarians, with mixed feelings – sometimes happily and at times perhaps unhappily. The law to be postulated is that nobody can become and succeed as a faculty member without associating with librarians. Most of the thesis written, and invariably all good books published, contain acknowledgement of thanks to library and librarian. Can the library help and guide the teachers in their scholarly pursuits is seldom clearly and openly acknowledged, though the fact is that the library and the librarian should be able to assist and help a teacher both qualitatively and quantitatively. There is the most useful library and information service, known as Current Awareness Service and Selective Dissemination of Information. In this service the librarian keeps the exact academic-interest-profile of each scholar and researcher and scans various micro-documents to match new articles and papers and ultimately informs the people concerned about the details. This service merely saves the time of the researcher and scholar.

7.1 Role of new Technology

Education has been continuously enhanced through new developments in information technologies. Libraries continuously aim to improve qualitative services to users. Basically there are three fundamental approaches to the use of new technologies within the library for the improvement of user's knowledge:

- Application to the basic processes that libraries currently support
- Adaptation of libraries in order to accommodate new types and forms of information such as electronic books, electronic newspapers, cable TV and virtual reality
- We could transform the idea of a library, and the services it should provide in an electronic age.

Further, education services could be better provided through the following means:

- By making existing library resources more easily accessibly to users
- Using resources in a way that is more friendly to the environment
- Making the jobs of library staff easier, less frustrating and less stressful.

7.2 New Media in Libraries

i) Acquisition of information
ii) Storage and delivery of non-printed information
iii) Storage and delivery of printed information by automated means
iv) Telecommunications
v) Management information services
vi) Human resource management services
vii) Project management.

7.3 Role of Librarians

The library personnel must have a clear view of the know how of information sources, management, retrieval and dissemination as well as global access to information with the tacit knowledge and this knowledge helps the end users to gain explicit knowledge. Libraries use a combination of strategies and tools towards knowledge creation, knowledge adaptation, knowledge distribution and knowledge review. The working style of librarians has been replaced and enhanced by the advent of new information technologies and the power of knowledge is now substantially recognized as an organization asset. The librarians should have following type of knowledge:

- Knowledge about libraries information source for assets, products and services
- Knowledge about types of information and sources required by their users
- Knowledge about where these sources stored are and what is its use
- Knowledge about users including teaching staff and researcher and who is using these information sources
- Knowledge about the libraries own competencies and capabilities
- Knowledge about the emerging library trends and technologies
- Knowledge about the current usage of these sources and how to increase its uses
- Knowledge about the acquisition process including book selection and collection development
- Knowledge about the Technical Processing includes Classification, Cataloguing, Indexing and Abstracting of the documents
- Knowledge about the Information Processing Retrieval.

The library information science professionals have to sharpen their communication and information analysis skills. They will transform into Knowledge Worker, Information Technicians, Information Engineers, Information Entrepreneurs, Navigators and computer specialists. The traditional roles of librarian are modified to take advantage of the new technologies and tools to meet the requirement of the people.

The Library and information science professionals are trained to collect, organize, retrieve and disseminate information to satisfy the intellectual needs of readers and scholars. The needs of the readers largely depend on the environment and situation they live in many such as economical, political, social and cultural constantly churn the readers and their needs. The library and information science professionals have to keep these factors of the users in mind. The Special Library Association has developed a list of competencies for librarians that, with little or no modification, would apply to a librarian in any setting academic, public, or special library. These competencies include:

Knowledge of evaluation and filter information resources

- Specialized subject knowledge
- Provision of convenient, accessible, and cost-effective information services
- Provision of excellent instruction for using the information resources and support for users
- Provision of market value-added information services and products
- Expertise in using information technology to acquire, organize and disseminate information
- Developing of specialized information products
- Evaluates the outcomes of information use
- Continually improve the information services
- Becoming an effective staff member
- Creates an environment of respect and trust
- Have effective communication skills, etc.

8. CONCLUSION

The human action and the information flow shall be the most dominant inputs to sound development strategy. For this the right information to right user needs to be the hands of the right people at the right time. The success does not rely on individual's knowledge, but the knowledge of the organization. Libraries and information centers are the places where knowledge sources are collected, processed, organized, retrieved and disseminate according to the requirements of the users. Knowledge dissemination is of equal importance as compared to knowledge innovation. Knowledge creators do not have much time and energy to look for knowledge users. An organization can achieve its goal, if sufficient opportunities are provided to its employees to enrich their potential by proper policies and programmes in the area of their interest. Professional competencies are further identified by knowledge in the area of information, resources, technology, management and research. The ability to use these areas of knowledge for providing library and information centers can be enhanced by the organizations polices. Therefore, libraries and information centers may play the part of knowledge tosser, use diverse media and channels to disseminate new knowledge. Also the Internet, with its mass information and extensive contents, will provide people with the main approach to searching knowledge and acquiring information. Finally libraries and information centers should also provide people with access to a variety of data, information and knowledge. It should support each of the phases of knowledge creation, knowledge capture, knowledge organization, knowledge storage and retrieval, knowledge diffusion and knowledge presentation and maintenance.

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Managing the Resources and Services of the University Libraries of the Jammu Region in the Emerging Knowledge Era

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Abstract: Indicates the ongoing process of transformation into knowledge societies and figure out the characteristics and work styles of such societies. Emphasizes the need for complete metamorphosis of university libraries taking best advantage of the existing technologies and keeping in view changing information access patterns. Includes fifteen common suggested strategies for transformation of Indian university libraries into knowledge resource and service centers. Includes a comparative study of the university libraries of Jammu region reflecting how far these libraries have modernized to meet new level of service requirements and concludes that these libraries are required to do a lot for providing adequate resources and rendering services matching to the requirements of a knowledge society.

Keywords: Knowledge Management, University Libraries, Jammu Province, Resources, Services.

1. INTRODUCTION

Modern society is characterized by the use of numerous terms exclusively emphasizing the primacy of information technology. The world of the 21st century is digitally infused: an e-world. In this e-world, e-encounters, that is, situations involving contact with electronic information tools and facilities are common-place. Digitally enabled 'communities' have become a normal part of life. Alvin Toffler forecasted in 1980 that: "a new civilization is emerging in our lives, and blind men everywhere are trying to suppress it" (Toffler, 1980). The term 'information society' is not new, being coined first in the 1960s (Mattelart, 2003, for an 'archaeology of the information age'), but has found its time since the explosive spread of the Internet in the 1990s, and the communication and information-access possibilities it offers. As per the European Commission report "throughout the world, information and communications' technologies (ICT) are bringing about a new industrial revolution which already looks to be as important and radical as those which preceded it" (European Commission, 1994).

The knowledge revolution has been enabled by developments in ICT, has led to the creation of knowledge society. As per Martin (2006), "Modern age has knowledge as its key commodity, that knowledge industries are the most central to global economic well being and knowledge workers the most essential to the maintenance of progress". Thus, the generation of new knowledge, management and use of knowledge resources is becoming crucial in the creation of wealth. Effective management of knowledge resources is now playing a key role in wealth creation and world's most strong economies are no more emphazing on industrial production but rather becoming powerhouses of knowledge. "Knowledge and idea based companies such a Microsoft, Google, Amazon. Com, Tata-Consultancy is thriving on their knowledge assets and making the life and work easier for human beings around the world"(Malhan, 2006).

An awareness of what is happening and what is important in a developing knowledge based society, can help information professionals to restructure their institutions, redesign their systems, ameliorate their operations, manage change and reorient their services to needs and conveniences of contemporary

and anticipated future customers. Because of globalization, growing competition and speedy access to vast global information resources, one can witness a spurt in knowledge activities and an enormously accelerating speed in work and action, "A generation ago, the average person had a 100,000 hours working life (40 hours x 50 weeks 50 years). To-day, we can do everything that person did in a tenth of time, a mere 10,000 hours. According to Peter Cochrane, Head of Research for British Telecom Labs, in the next generation people will be able to do that in 1000 hours" (Menon, 2002). Just in time access to information, just in time learning and quick decision making and fast action are the work styles of the knowledge society. Because of instant access to global information resources on desk tops, the per capita use of information has increased and generation of new knowledge and ideas has also accelerates. The major problems faced by the society now are data mining and quickly searching the worthwhile information relevant to one's needs.

"In the knowledge society, the hierarchical and bureaucratic management structures are getting dismantled and are being replaced by spatial management, because knowledge and expertise resides in every perceptible human mind and not a prerogative of high fliers. The knowledge seeker in fact is trying to find a connection between what already exists in his/her mind and what exists in his external environment. Continuing education and capacity building is therefore is very important in knowledge societies. Industrial society recognized learned men and women; the knowledge society places high value on learning men and women because human beings become obsolete as quickly as machines and require to be continuously equipped with new skills and competencies. However, it is not the machines but human beings who ultimately decide what information is critical for the organization and can give any context or meaning to the information received or communicated. Because of high competition, constant hunt for talent is the focus of knowledge societies. Organizations are trying very hard to employ the best possible persons with the belief that innovations will automatically follow once the best brains are hired" (Malhan, 2006).

2. UNIVERSITY LIBRARIES

"Libraries play a vital role in the world's systems of communication and education. The numerous resources and services that libraries provide help people carry out their work, studies, and leisure-time activities. Libraries rank among society's most important and useful cultural institutions...Libraries provide access to knowledge and information that has been accumulated throughout history. People of all ages and all walks of life – including students, teachers, scientists, business executives, and government officials – use library resources for their work. In addition, large number of people turns to libraries to satisfy a desire for knowledge, to pursue a hobby, or to read in their free time" (World Book Encyclopedia, 2007).

Libraries are one of the marks of civilization. As the scientific revolution took hold university libraries started to become significant, taking on many of the characteristics that are recognizable in today's libraries. University libraries mainly contribute to the library wealth of the nation and also are the 'hearts of the universities.' University Libraries providing access to organized collections, assist users in information search, promote the research activities and projects and circulate documents within the stipulated period of time. Most have automated their operations for greater efficiency and provide additional facilities like use of the Internet. These services are not enough to meet the information service requirements of emerging knowledge society. A number of alternatives are available for accessing academic information, thus the university libraries monopoly for providing academic information is getting eroded. University libraries are thus also facing fierce competition from alternative

information providers. Merely providing more funding for developing collections, facilitating access to more databases and having more space for reading is not enough for a modern university library to meet the level of service requirements of a knowledge society. Strategic planning is required for complete transformation of university libraries for their ultimate conversion to knowledge resource and service centers. Some common developmental strategies suggested by the first author are;

2.1 Core Unit of the Institution

University library is often referred as the heart of institution or nerve centre for various activities. However, when viewed from a senior management perspective from an industrial age corporate mentality- they often have been classified as overheads unable to demonstrate visible contributions to the productivity and profitability of the enterprise. University library system thus should not be considered a peripheral service but one of the core unit of the institution central to the knowledge activities of the university.

2.2 Development of quality control methods

University libraries should develop quality control methods and criteria to strictly evaluate and acquire print and e-information resources which the academic community may use.

2.3 Cross disciplinary communication

Libraries must jointly evaluate the open access Internet information resources and create virtual libraries for rendering just in time information. Libraries even must go beyond these efforts to collect information and index useful blogs and thus create expert databases for providing referral service to establish person to person contacts and link information with information in the interest of generation of new knowledge. They should also encourage cross disciplinary communication of information among related fields.

2.4 Monitoring and review committee

Under the INFLIBNET programme, the UGC must set up a monitoring and review committee to speed up the process of retro conversion of catalogue records in Indian Universities and set time targets for this so that online union catalogue of Indian university libraries is made available for the identification and location of collections. Libraries not having adequate staff for this purpose must get this work done through outsourcing. UGC may stop funding such libraries that are not making a steady progress in this direction.

2.5 Library Network

There is no place for stand-alone libraries, university libraries must get connected to various library networks. In addition to this, they must integrate and establish synergetic relationships to other information institutions to provide outreach services and make still greater contribution for dissemination of knowledge. For instance agricultural university libraries may collaborate with rural public libraries for dissemination of agricultural information and transfer of agricultural technology in rural areas.

2.6 Information literacy programmes

There is a gap between users' knowledge of information resources and services and ongoing developments in the information world. Because of this gap even the existing services such as e-journals made available under the Infonet are not adequately used. University libraries therefore must organize information literacy classes to convert human beings into human resources. At the national level, the

UGC must develop a policy document to integrate information literacy with the courses of study. This will also help to bridge the digital divide.

2.7 Continuing education programme

There is also a gap between the existing knowledge of library personnel and skills and competencies required to handle newly emerging information tools and technologies. A continuing education program for library personnel should be in place for greater contribution of library personnel. When the staff is trained new technologies and methods of handling information automatically get integrated in their work culture. As library professional role is no more limited to merely classification and circulation of documents, they should also take initiatives to continuously learn to improve their skills and competencies to stay competitive and stay ahead.

2.8 Innovation

University library personnel should share ideas to develop innovative library and information services. They should continuously find ways to counter delays in information access, lower costs, and increase service. "The common knowledge database projects at Rutger's University allows reference librarians to share resources and strategies for serving academic library patrons" (Jantz, 2001).

2.9 Administrative reforms

University libraries should also introduce large scale administrative reforms and do away with rigid rules in favour of flexible provisions which helps everyone. They should metamorphose into performance oriented libraries and not procedure oriented libraries. If some procedures are inevitable, they must save users time and should not be inconvenient for users.

2.10 Creation of new services

University libraries should devise services, which may help in work processes and work flow of the institution. For this, the university library may even collaborate with other units of the institution. For instance, the library may collaborate with faculty to develop e-content guides for various courses of study, develop a online database of ongoing research projects, develop information products and tools urgently required by the institution, etc.

2.11 Information Technology Cell

University libraries should have strategies in place to deal with new technological advances and developments. Universities must have strategies to use every development in IT to their advantage. An IT cell be set up which constantly keep watch on the developments in the IT and see what is relevant, cost effective and latest hardware and software for the university library system. Latest knowledge management tools and techniques and useful databases should also be evaluated for their usefulness for the university.

2.12 Sympathetic Way

Users are hard pressed of time and no more visiting the university library to spend their leisure or spending long hours to read any document. They are mostly visiting the library with a purpose and when they are looking for information, they are trying to solve their problems. Professionals must help them in a sympathetic way, guide them through wit and skill and ultimately seek reflection of satisfaction and smile on their faces. Every university library must have its website to keep them informed. Users are now facing the challenges of info stress and hence they should not be loaded with information but provided most relevant and pinpointed information.

2.13 Efficient consultancy

The ultimate emerging in house operation in the university libraries is quality filtering and trafficking of information so that the right information reaches the right person at the right place. The ultimate role of university library professionals is to act as consultant to solve users problems at hand through information prescriptions and provide referral services and thus build their capacities to make them more effective, productive and successful in their work.

2.14 Knowledge resource and service centers

An average user is facing the double challenge of fast pace of knowledge society on one hand and an ocean of information on the other hand. Users generally have no time to find what is best for them in a given situation. Here lies a great opportunity for university libraries to become knowledge resource and service centers. University libraries however, should constantly research what more they can do to serve the user communities, add value to library services and add convenience to the lives of user communities and save their time. A knowledge resource and service center will succeed in its mission only when its users start succeeding in achieving their objectives. As the information is getting unbundled, these centers must provide information-packaging service and facilitate on demand customization of information packages. They should constantly improve quality of their service and achieve zero defects between information asked and information supplied.

2.15 Free and fast services

While facilitating metamorphosis of university libraries into knowledge resource and service centers, every care should be taken that these centers do not largely commercialize their services. Their services should be free and fast because for millions of poor Indians they will be oasis for knowledge. Their services in fact should be rendered in a humanistic way" (Malhan, 2006).

3. SCENARIO OF UNIVERSITY LIBRARIES IN JAMMU PROVINCE

Rapid advancement of the ICT has evolved a number of terms for the library like:

- Paperless library
- E-library
- Hybrid library
- Virtual library
- Digital library and so on....

Libraries are working in the atmosphere where changes are occurring rapidly leaving no time for it to overcome with that change. As per the Bauman (2000) "society is being transformed by the passage from the solid to the liquid phases of modernity, in which all social forms melt faster than new ones can be cast". Indian university libraries are able to quickly metamorphose and step into the roles wherever opportunities are created by the advances in technology. Slow process of planning and implementation of plans, non-availability of requisite funds and lack of continuing education of staff are some of the reasons for quick adoption and absorption of technologies in the work processes and redefining the service levels. Though some efforts have been made for modernization of the university libraries in the Jammu region, yet these libraries are still to achieve the high level of service demands of knowledge society.

Jammu province of J&K state has three academic/university libraries i.e. University of Jammu, Shri Mata Vaishno Devi University (SMVDU) and Baba Ghulam Shah Badshah University (BGSBU).

Among these the oldest one is University of Jammu. All the Universities libraries are the hybrid one. A comparative account of the management of the resources and services in the University Libraries help to analyse the scenario of academic libraries in the region.

Comparative point	*University of Jammu*	*SMVDU*	*BGSBU*
University Library	University of Jammu is 2 km. far from the Jammu Railway station and located in the District Jammu. Its Library has shifted to new campus in1980 and renamed as Dhanvantri Library in 2002. A separate four-storey building located in the centre of the University is for the library, having adequate reading capacity on each floor of the library. Library is headed by a Professor Incharge	SMVDU is 35 km far from the Jammu Railway station and located in the District Reasi. Its library was established in the year 2004 and presently located in the C-Block, IInd floor. A separate building for library is under construction and the reading capacity available in the library is just for 50 users at a time. The library is headed by a professional Librarian.	BGSBU is 160 km far from the Jammu Railway station and is located in the hilly area of District Rajouri. The library was established in 2007. Library is single storey and all the activities are operated in the ground floor. Reading area can accommodate about 150 users at a time. The library is headed by Assistant Librarian.
Administrative set up	Here, I/C Librarian is assisted by four Dy. Librarians and each Deputy Librarian is further assisted by a number of Asstt. Librarians, Professional and Semi-Professional assistants. Each department has its own departmental library. Around 4500 users are the library member and nearly 500-600 users visit library daily. The staff strength is 52. Among these 30 are professionals, 2 are computer scientists and rest are helpers. All the professionals are M.L.I.Sc. In addition to this, 2 are having Ph.D. and 1 has qualified JRF/NET in the field.	The total staff of the library is 10. Among these 7 are Professionals, all having M.L.I.Sc. degree and rest 3 are helpers. No departmental library existing till now. The total number of library members are 1300 and around 150-200 users visit library daily.	The total staff strength is 7. Among these 3 are Professionals, all having M.L.I.Sc. degree and 1 has qualified NET in the field and rest 4 are helpers. No departmental library existing till now. Library members figured around 1000 and 100-150 visit daily.
Management of resources	Central Library has more than 95,000 collections which are housed in different sections for the use of library members. To enhance the library collection, library is getting around Rs. 25 lakhs per annum. The different sections of the library in which resources are managed as per the call number are: Stack area, J &	Library housed around 20,000 resources which are available to users as per their need. The library grant is around 20-25 lakhs per annum. Resources are arranged in stack area, reference section and periodical section according to call numbers.	Library collection is around 10,000 out of which 8694 is acquired and rest are gifted one. Each department is getting the grant for the purchase of books which is around 10-15 lakhs per annum. The different sections resources are managed as per call number: Stack area, Reference

Comparative point	*University of Jammu*	*SMVDU*	*BGSBU*
	K section, Periodical section, Text-book section, Reference and Documentation section and International Resource Cell.		section, J & K section, Dogri section, Gojri section, Periodical section, textbook section.
Management of services	Working hours of the library are 9.30AM -5.00PM from Mon. to Fri. Internet facility from 9.00 AM TO 8.00PM from Mon. to Fri. Reading facility 24 hours and Consultation facility from 9.00AM - 8.00 PM.	Working hours of the library are 9.00AM – 5.00PM from Mon. to Fri. Internet facility is available for professionals only. Reference facility is available from 9.00 AM – 8.00pm & 9.00PM – 10.00PM from Mon. to Sat. and on Sunday from 10.00 AM - 5.00PM.	Working hours of the library are 9.00AM – 5.00PM from Mon. to Sat. Internet facility is available during working hours. Consultation/ Reading facility is provided from 9.00 AM – 8.00 PM and proposal is in process to extend it up to midnight.
Library automation	Library has completed the automation project by using LIBSYS software. Acquisition, Cataloguing, Serial, Circulation, OPAC modules are working. Open Access to library material. Access to e-journals (jstor, inflibnet, etc.), e-databases (Thomson, Ebesco, etc.) free of cost. As the library is the member of DELNET, so users can access its database and have a copy of it as per rules. It also provides video-conferencing facility and educational satellite facility through EDUSAT lab. Library has more than 300 CD/DVD which can be accessed by various means; Audio/Video by DVD player and educational by computers. Reprography facility is available @ Rs. 1.80 per page.	Automation work is going on with LIBSYS software and only circulation module is working. Virtual library helps to access the catalogue, e-journals, e-databases, references, patents and repository. Library has associated with AICTE-INDEST consortium and allows online access of 1200+ journals. As the library is the member of DELNET, so users can access its database and have a copy of it as per rules. Inter Library Loan facility is also provided. Library has more than 1000 CD's which can be accessed by means of LAN. Reprography facility is available @ Rs. 1.00 per page	Automation work is going on with SOUL software. As the library is the member of DELNET, so users can access its database and have a copy of it as per rules. More than 200 CD's which can be accessed by computers and have a print out of that @ Rs. 1.00 per page. Reprography service is provided @ Rs. 0.50 per pages

http://www.jammuuniversity.in/campus_library.asp

http://www.smvdu.ac.in/LIBRARY/libraryindex.htm

http://www.bgsbuniversity.org/central_library.htm

4. CONCLUSION

It is the core reality that the advancement in the ICT has left the impact on the availability of knowledge and learning activities, and in turn the working of libraries. After nearly two decades of establishment of library of University of Jammu, SMVDU and BGSBU libraries got established in

Jammu province that's why both the libraries are in budding stage and Dhanvantri Library of the University of Jammu is well established. Still all the libraries are the developing organizations which have to work with right staff with the right skills in the right structures to provide the right information to the right user at the right time. Both the budding libraries are the product of knowledge society but they have not fully adopted the paperless or electronic or digital library pattern of development. Initially, both got started in the traditional manner and simultaneously adopting the electronic information handling to some extent. Bellinger (2004) has well said "The value of knowledge management relates directly to the effectiveness with which the managed knowledge enables the members of the organization to deal with today's situations and effectively envision and create their future. Without on-demand access to managed knowledge, every situation is addressed based on what the individual or group brings to the situation with them. With on-demand access to managed knowledge, every situation is addressed with the sum total of everything anyone in the organization has ever learned about a situation of a similar nature." It can be concluded that all the academic libraries of the Jammu region are trying their level best to organize and manage the resources and services in an effective and efficient way; inspite of various loopholes like SMVDU have less reading area but the services are provided to each user at its own desk. BGSBU and SMVDU are located far from the main locality and thus, the transportation service is not well developed and it is not easy to reach the university. Dhanvantri Library has completed the process of automation to a large extent, so that various library operations can be performed efficiently and effectively. However, because of some inherent problems in the automation work some automated operations are yet to take off. In contrast to it, not only the automation work but also the construction of library building is under process in rest of the two university libraries. It can be analyzed that a library must be well developed in all its facets so as to provide the better services to the users of the institution and met the level of service demands of the knowledge society.

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Need of Special Skills for Development of Educational Museums

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Abstract: This paper attempts to describe significance of Educational Museum attached within academic libraries in the research projects. Today with the advancement in the Library Science and applications of more and more IT in the development and maintenance of educational museums need to be looked with difference and modern angle. Management of museums now need especially skilled professionals considering this point of view. The paper further highlights the need of professional skills and discusses them in details. Paper finally examines the problems in acquiring the special skills by the library and information professionals and tries to provide some solutions.

Keywords: Professional Skills, Development of Educational Museums

1. INTRODUCTION

The researcher visited and surveyed some colleges at Raigad Dist. (Maharastra, India) and it was found out that major libraries did not know about Educational museums and use of antiquities for learning purposes. The researcher interacted with library professionals and found that further work needs to be done in this field.

2. CHANGING ROLE OF THE COLLEGE LIBRARY

Now a day's libraries & library professionals face a great challenge about their survival in the age of information technology. Today, the internet is taken the responsibility of controlling the problems like collection, organization, storing, retrieval and dissemination of information. The automation of libraries has also brought significant improvements in the library services.

This revaluation is posed today to transform our own knowledge and heritage. It has become a part of our day-to-day lives. It can be the vehicle for taking us into the knowledge society of the future. Some quality control metrics can be automated and require careful review. Adhering to such methods ensures that real quality assessment becomes an integral part of developing and managing the college library.

While preservation has long been concern of archives it has only recently been of interest to a much larger community. Preservation refers to enhance objects technical longevity and quality. Persistence is a much broader notion encompassing preservation, but also referring to whether the object would still exist in any form at all in the future. Persistence implies a commitment to both maintaining the object and keeping it accessible.

Considering the changing nature of information retrieval system in academic libraries the need of readers was improved. The reader wanted to know original thing or the automatic source of information for the fulfilment of information requirements, the educational museum section will be helpful to library management.

3. EDUCATIONAL MUSEUMS

The role of museum in formal education is very important. Resourceful museums are a creative activity for the student, the aim and object of any educational institution is to teach, to help in research work of its students and staff. The collection of academic museum forms an important teaching resource. The administration of such museum depends upon the nature of institute, management of such educational museums were by separate committee and its chairman or Director. The funds are supplied by U.G.C., or other sources such as Trust Fund, sponsorship fund, natural art collection fund etc.

3.1 An example of such type of educational museum is

- **Deccan College Post Graduate and Research Institute Museum,** Poona, Maharashtra, India (1939). The museum contains tools, skeletons and fossils of the stone ages, the excavated materials from, Nashik, Newasa, Jorve, Maheshwar etc. are kept here for the study of local history.
- Recently **Ruparel College, Matunga, Mumbai,** has established **museum** section in the college library and kept manuscripts of local Marathi authors and handwriting of social reformers.
- **University Of Mumbai** has old and largest **Educational Museum** At Fort Campus Mumbai.

Delegates have an opportunity to visit this prestigious heritage.

- **Bharat Kala Bhavan, Hindu University, Varanasi (1950)**

The important collection of Indian paintings, textiles, jewellery, coins, manuscripts are kept here for the study of Indian History. This museum was originally a private collection. In 1950 it was transferred to the university for educational purposes.

3.2 Other Museums

In India the following educational museums are functioning for academic purposes as follows-

- **Kausambi Museum at Allahabad (1952),**
- **Ashutosh Museum of Indian Arts, Culcutta (1937)**
- **Department of Archaeology Museum,**
- **Maharaja Sayajirao University, Baroda (1950)**
- **24 Hour Museum. A gateway to information about UK museums.** Includes an advanced museum locator, up-to-date museum and gallery news, links to educational resources and a variety of other features.
- **The world's first ever Government-recognised National Museum** which only exists in c Le Louvre The Louvre's Louver history derived from 18th century when Philip Augustus had built the powerful fortress for defensive warfare. Today Louver is one of the greatest world museums. The Louver guards collections of the remarkable work of art - collections of paintings, sculptures, engravings, drawings, goblins, ivory items, porcelain, ceramics, bronze... The official web-site of the museum tells about Louvre's history, its collections, expositions and exhibitions, educational programs, excursions and last events.

4 NEED OF EDUCATIONAL MUSEUM SECTION IN ACADEMIC LIBRARIES

Museum Association of India is contemplating the researcher's service. The Association considered Museums and Adult Education Department, at par for the use of masses, study on Arts and cultural life of the community and support for formal universities, colleges and school level education.

The educational museums play an important role in formal education. Unfortunately the situation of Indian educational museums is very poor. Number of reasons for this could be due to lack of funds, unavailability of expertise. If the management of such type of museums would play more useful role in developing process such type of museums are more useful for storage display ,presentation, conservation study Museums provide information services with value aided interpretation of antiquities publication of guide book, Dissertation and model answer papers of the ranker student in the holding of museums proves to be more beneficial than other reading materials to students and scholars Some resources require careful human review such museum project should work for carry out the quality control of library services. A museum section of library is an integral and integrated set of services for storing, searching, protecting and retrieving information.

- Museum services: Supply the original and critical information.
- Museum architecture: emphases organisation, acquisition, preservation, and utilization of information.

Good Museums systems are realization of quality networking of total library services.

The University of Pune is planning to set up a music library, housing a collection of priceless old Marathi songs and Hindustani classical music. Vice- chancellor of the university of Pune, (INDIA) Narendra Jadhav Said on 27th Aug 2008 that in Press conference " Some music enthusiasts in the city had come to me and expressed willingness to donate their priceless (because price will not calculated in any currency) collection to the University of Pune. The university will preserve this collection by creating a dedicated music Library.

Reforms and Competition

The main objectives of any library are exchange of information. Museums had an enough scope to interaction functions of library. For the users need full-fledged activities of museum section definitely played a major role in teaching learning process. Healthy competition has ensured that benefits of skill and technology advancement have been needed to pass for the readers. This is an advanced stage and the requirement of original information making available for end users.

The following flow chart shows the difference between traditional and modern (educational museum section) concept of functioning for the teaching–learning processes. The teaching learning process of traditional method has given stress on the classroom instructions and laboratory experiments whereas the modern concept teaching –learning has given stress on self learning.

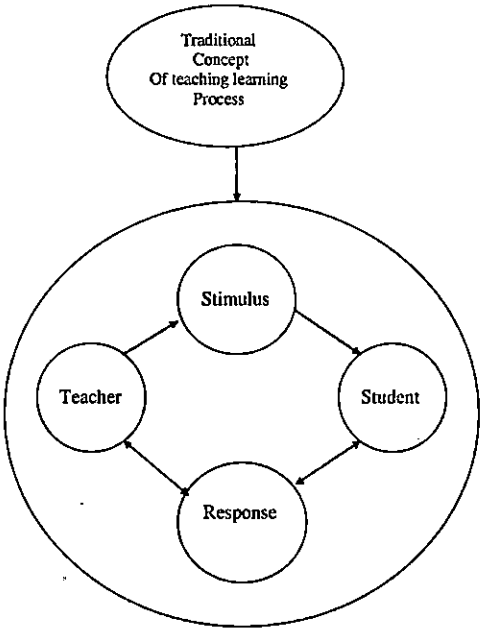


Fig. 1: Traditional Concept Of teaching learning Process

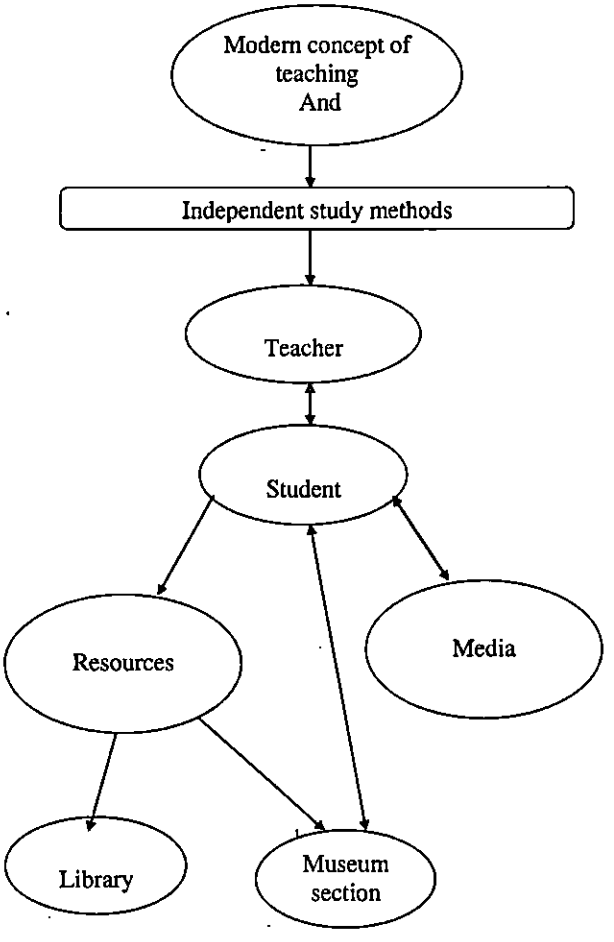


Fig. 2: Modern concept of teaching

5. NEED OF WELL-TRAINED STAFF

If you want success in any task the role of trained staff is very important. Recently some universities and educational institution are taking keen interest in marinating the educational museums. The U.G.C. has traced on the changing functions of museums as educational institutions.

Librarians have been pioneers in adopting new forms for the betterment of services .but the scenario now is very volatile .The resources have become dynamic also these changes as and when new ideas emerged for that reason librarians and staff need to visit the core museums so that they should think about add ional skills to be needed to meet the challenges future will bring librarians need to identify new issues ,formulate a vision for future information is an idea that builds a bridge between the states of artefacts and meaning in people lives ,it implies that not only the users need but also true way in which they access information for this purposes to meet this specific challenges the need of well trained staff is very sectional while agreeing with the views that our educational museums are rich and they are for the services of the community .For fulfilling the functions of the educational museums the role of staff is very important and they must carryout the work with responsibilities .But unfortunately today in India the staff is working in such sections is not adequately qualified or has no skills to maintain educational museums .Libraries have to be prepared to invest in human resources if they want high quality flexible staff. To meet the demands of new educational museums sections libraries have to make sure that their staff has sufficient possibilities to acquire new knowledge and skills in the area of musicology .

So such appointed staff needs to acquire additional necessary professional skills for effective management of educational museums.

Unfortunately in India the status and qualification of museum keeper /curator /technical staff is not appropriately defined for the purposes.

The number of smaller educational museums do not have separate staff at all .Well trained staff is required and those who are already working must go for reorientation training .however to facility this ether short term or long term programmes are not available in Maharashtra.

6. SIGNIFICANCE OF THE PROBLEM AND NEED

In developing country as like India having great culture and heritage people learn about museums from the Britishers.

The subject is quite important for the researcher while bringing about the educational museums development in India . For educational use museums play very important role if we need good services then we must arrange quality museum section in libraries. As per the requirements the researcher has initiated a project of framing an educational museum section in academic libraries for development of educational standards in India.

6.1 OBJECTIVES

a. To secure the need of educational museum section in college libraries
b. To suggest guidelines for development and maintenance educational museum section in college libraries
c. To ensure the support of educational museum section in college libraries to the student of under and post graduate.

7. SCOPE FOR DEVELOPMENT AND MAINTENANCE OF EDUCATIONAL MUSEUM SECTION

i. Development of educational museum section is pertaining to the management of such section attached to the libraries in the in the colleges, universities and small educational institutes.

ii. Study is confined to educational museums situated in Mumbai and Raigad District.

iii Evaluation of Existing museum section in college and universities in Mumbai region.

iv. The project is limited to the development of Educational museum section in academic libraries.

8. PILOT STUDY AND ITS FINDINGS

Pilot study was conducted for knowing present situation of educational museum section in colleges of Raigad Dist. and university of Mumbai. Opinions Principals and Librarians of major Colleges which having "A" Grade Accreditations were considered.

The Pilot survey indicates that:

i) 100% college libraries have not their separate museum sections.

ii) 25% college libraries have kept some things in one or two compartments of cupboard.

iii) 80 % colleges have kept antiquities in Principals Cabin only.

iv) Not a single college library has separate building for educational museum sections or even for the library.

v) According to opinion of principal respondent such section is useful for the study of antiquities, political science, culture and local history.

vi) 100% respondent agree to exhibition of answer books of last year topper students will be very useful for current student if it well managed educational museum section at libraries.

vii) All the respondents have not guided from any central authority of universities or government for development of such section in academic libraries. It indicates that there is a need of guidelines for development of such sections

viii) 67% respondent have expressed need to maintain such section with skilled staff.

ix) 75%respondent pinioned that such section will be part of college libraries.

x) 100% Respondent agree to each university libraries must have an education museum section.

It is felt that such research will be benefited for development of educational museum section in academic libraries in the specialized areas of museology.

9. SURVEY OF EXISTING EDUCATIONAL PROGRAMMES IN MUSEOLOGY AND ARCHAELOGY

During the British India governor General Lord Ropon decided to train curators through department of museology. Second all Indian museum conference was resolved that the different branches of provincial museum should be under the supervision of expert management and that no exhibition of specimen can have much educational values unless it is arranged and supervised by a man who has made special study of this field.

Indian school played a major role in field of archaeology in the year 1959 actually training was started with the first batch of students. In India many committees where set up to look into the working of the museums and training of curators, e.g. Wheelar Review committee and Dr. Motichandra

committee. The department of museology of the university of Culcutta is one the pioneer such university museology department in India founded in year 1959.

Only one university e.g. M.S.University Vadodera (Gujarat) a full fledged museology department by then (1942 has been offering museum studies courses for more than 50 years alumina now include several 100 of its ma in museum studies).other universities and alike institutions followed suit e.g. Banaras hindu University Varanashi, Aligadhmuslim University, Osmania University, Hydrabad, Prachi Niketan, Bhopal, Birla institute of technology of Science, Pilani and later the National museum Institute of History of Art, Conservation and Museology, New Delhi. In fact success in museology training in Indian Universities had inspired many other universities abroad to initiate such training.

More recently in 1989 the national museum New Delhi was granted the status of a "Deemed University" this commenced its university level courses at qualifications at both M.A.and Ph.D levels since 1990.

10. PROGRAMMES IN UNIVERSITIES IN MAHARASHTRA AND THEIR INADEQUACIES

Across the Maharashtra it noted that University of Mumbai is oldest and had big museum section and larger number of antiquities collection .But such university has no degree or PG Courses related to museology or archaeology. Prince of Wales museum(Now Chatrapati Shivaji Museum) located in Mumbai has great historical reference but there was no concrete Syllabi for training of manpower .

Just now one college i.e.K.C.College Mumbai started three year integrated degree courses as "Bachelor in heritage management" The fees of this courses are so costly and this course is dose not highlight the museum functions in the library .It indicates that the exising educational programs are inadequate and theststus affects the functioning the museum .

In the 2nd week of Oct 2004 one workshop was arranged by directed of libraries Maharastra state and Raja Ram Mohan Roy library foundation at darabar hall, Central library Mumbai.

This workshop resolved that

1) Need of Absorb new branches in the field of library science as requirement of time.
2) Revision in the syllabi of the courses in library science must be undertaken.
3) Supply of skilled manpower is a jointly responsibility of Government and Educational institutes.

All the above programmes at national and local level are not enough and competent to generate and developed required manpower for the managing educational museum looking into the efforts there is enough scope to plane the courses such as an Advanced P.G .Diploma /degree in museology and certificate in museology these courses could also be taken as supplementary courses by the existing library science trained library workers or by the fresh library science graduates as an extension of additional qualification .

11. LIST OF SKILLS TO BE CONSIDERED FOR DEVELOPMENT AND MAINTENANCE OF MUSEUM SECTION

Recently some state government like Gujarat taking decisions to introduce open book exam system .it will be affect the traditional libraries services. Such decision can result in a reduction of reference

books. All of us appreciate the decision but also realise that the libraries will have to make drastic changes in the management of information resources as like educational museum section which is useful to teach their students directly.

There are grounds for serious concern about the quality and professional relevance of the development of educational museum section will be needed some skills as follows.

i) Knowledge of resources to develop collection of the museum antiquities.
ii) Special cataloguing and documentation with graphics.
iii) Different classification methods and schemes.
iv) Digitisations of antiquities as live all sides and same digital preservation.
v) Different preservation techniques.
vi) Knowledge of national and state level culture and heritage preservation policy programs
vii) Skills about inter museum loan and exchange services and networking.
viii) Copyright.
ix) Creating databases of educational museum collection and providing referral services
x) Skills for community services museum resources
xi) Knowledge of organisation and management of museum section.

12. CONCLUSION

India the country of melty languages and multy Rilegence need to be integrated .Educational museums helps a lot for interaction in local history and heritage. When we look into the future world, it appears to be more dependent on libraries, but not the nature of today's libraries. That is why transformed libraries built with a shared vision. This is because libraries will involve citizens in planning and delivery of information and learning services they will provide local and virtual space for research, education and problem solving and will be responsive to the information and learning needs of each local community.

In research libraries especially which are attached with PG courses in historical and cultural studies role of educational museum section is very significant .If the work in such type of museum section is done with scientifically it would be more meaningful in research point of view.

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Planning, Designing and Setting up of a Technical College Library with Respect to Infrastructure, Collection Development, Automation and E-resources: A Study

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Abstract: This paper attempts to identify the various problems faced by librarians in the setting up of an engineering college library with respect to infrastructure, collection development, automation and e-resources. It endeavors to study the present status of newly established engineering college libraries in Mumbai with regard to the fulfillment of norms of the A.I.C.T.E. The research methodology employed involved a questionnaire sent out to librarians of engineering colleges in Mumbai.

The findings of this study indicate that a majority of the engineering college librarians were actively involved in the setting up of the library. Although they were all aware of the norms and standards of A.I.C.T.E. not all of them conformed to the norms. The response of the librarians was very positive towards the usage of computers. In this electronic age a majority of libraries were partially automated, all the librarians believed that today's libraries need Computer and Communication Technologies and that users today are computer literate. Most of the libraries provided OPAC facility for information retrieval, Bar-coding facility for books, online access to e-journals through consortia and computers as a parallel media for knowledge exchange was recognized and accepted by most librarians.

This study has brought to the forefront the changed role of the library in the electronic era coupled with the changing role of the librarian. It has proved that modern libraries have to be set up and managed according to modern practices considering advances in computer technology and diverse information formats.

Section II covers Planning of an engineering college library, Section III covers Engineering education: growth and development, Section IV covers Review of literature, Section V covers Results, Discussion and Conclusion.

Keywords: Librarian, Planning, Engineering College Library, Librarianship

1. INTRODUCTION

Traditionally the library has been seen as the heart of every academic institution, a place of fundamental importance to every student, teacher and researcher on campus. The library is the most important component of any academic institution and without a library no new university, college or school can be set up.

The world in which libraries have operated has changed dramatically in the last several decades. For centuries, the basic operational structure of libraries remained unchanged. However, the advent of the World Wide Web and the shift of information resources to electronic format have resulted in a revolution in the ways that libraries operate. The emergence of Computers and Communications Technology have brought information to the desktop of the students.

Engineering college librarians have to realize that the current trend is on electronically delivered services. This is a time that necessitates innovative ways of thinking about collections, services, information access and also the changing role of an academic librarian. Librarians cannot live in the past but must look to the future and anticipate what another decade might bring. In this ever changing world of technological advancements, an engineering college library and librarian has to change with the times.

2. RESEARCH METHODOLOGY

In view of the nature of the problem, the research methodology employed involved a questionnaire sent out to librarians and library staff of various engineering colleges in Mumbai. A total of 40 engineering colleges were selected ; 32 librarians responded to this questionnaire.

3. PLANNING PROCESS

Planning is one of the most important project management and time management techniques According to Penna (1970) "..... Unless librarians are active and knowledgeable partners in the planning process, they will cease to be architects of their own profession".

3.1 Government Regulations and Requirements

Any institution that seeks to acquire sanction to function as a full fledged engineering institution has to fulfill certain norms and standards. The main apex body responsible for the governance of engineering institutions is the All India Council for Technical Education (A.I.C.T.E.), besides the Directorate of Technical Education (D.T.E.) and the University of Mumbai.

3.2 AICTE norms for establishment of new technical institutions

The following are some of the norms of A.I.C.T.E. to be followed in the planning and setting up of engineering college libraries-

Table 1: Norms and standards of AICTE

Name of the course	*Engineering and Technology*
Total permissible intake at the start of the engg. college	240
Total Area	400 square meters
Total number of books	4000 volumes
Total number of journals	11 per course
Total number of computers	4 computers with multimedia facilities, duly networked

3.3 Library Building

A purposeful and elegant library building is a tribute to the esteem in which the academicians hold their institution. The choice of the library should be governed by the consideration of its centrality of the venue on the college campus. The planning team, of which the librarian is an essential part, should ascertain the needs of the library then draft a 'Library Building Proposal'.

The interior of the library should be divided into various areas like Display Area, Catalogue Area, Circulation counter, Stack area, Reading Area, Reference Area, Computer Area and Technical Processing area. In this age of computers, the catalogue cabinet has given way to the O.P.A.C., the circulation counter needs a bar code scanner and a printer and most computers in the library today have a multimedia kit including headphones.

3.4 Collection Development

The world of the 21st century is a world of technology, innovation, and uncertainty. In today's information age the collection development policy has to be assessed in terms of the print and non-print media. In the context of building an engineering library in the modern information era, the library collection will include books, periodicals, electronic and online resources.

Books, both textbooks and reference books are the main staple of a library collection. There should be a balance in the collection depending on the needs of both students and faculty while following the norms of A.I.C.T.E.

Journals and magazines are published on a continuing basis and they require an ongoing financial commitment besides large amounts of space on the library's bookshelves.

Today more and more information is being stored digitally and disseminated electronically. **Electronic resources** like CD's and DVD's form an important part of the library's collection. Nowadays a number of books have CDs accompanying them. In addition special topics in Humanities subjects like Communication skills and Personality development need CDs.

The Internet is a vast library of information. Nowadays a lot of **online resources** are available at a much reduced price through consortia or networks For example access to I.E.E.E., INDEST-AICTE Consortium, DELNET and Science Direct. The librarian needs to evaluate these resources in terms of the cost and usage and then avail of online subscriptions.

3.5 Computers

The use of computers in library activities is known as "Library Automation". Library automation involves the computerization of routine library activities like Acquisition, Classification, Cataloguing, Circulation, Serials Control and Stock Taking.

The need for computerization of libraries was felt because of the following reasons;

- Exponential growth of knowledge
- Need for timely and accurate information
- Information available in a variety of formats
- Emergence of information networks
- Online database searches
- Resource sharing among networks

The computerization of the library would help to manage funds, acquire print and non-print materials; assist in search and retrieval of information, support bar coding, help to achieve compatibility with resource sharing systems and move towards integrated systems.

There is a massive increase in the volume of information, as well as the different formats in which information is available. There is also a change in the expectations of the users. In order to integrate new technologies along with traditional services, various library software are available in the market today. These include SLIM ++, SOUL, e-granthalaya and LIBSYS, besides various software developed in-house.

The engineering college librarian plays a very crucial role in the entire planning and delivery of library services. The availability and use of electronic resources has changed the fundamental roles, paradigms, and organizational culture of libraries as well as librarians. The transition of traditional library collections to digital or virtual collections has presented the librarian with new opportunities.

In today's world librarians have acquired varied facets to their already existing roles. One sees the librarian as a Search Intermediary, Information Navigator, Knowledge Manager, Facilitator and End-User Trainer.

Engineering college librarians need to know not only technical skills and knowledge of computers but also Communication skills. Librarians should assert themselves, their area of work and their services

through active participation. It depends on librarians to recognize their role in the changing electronic scenario.

4. ENGINEERING EDUCATION: GROWTH AND DEVELOPMENT

Technical education in India contributes a major share to the overall education system and plays a vital role in the social and economic development of our nation. In India, technical education is imparted at various levels such as craftsmanship, diploma, degree, post-graduate and research in specialized fields.

The State of Maharashtra, which is a pioneer in technical education, contributes more than 50% to this educational achievement. In the West, of the engineering colleges, 172 are located in Maharashtra. Of the polytechnics in the region, the share of Maharashtra is 174. However not only is the education system in the technical sector failing to match the demands of the workplace, a lack of regulation and planning by the AICTE has allowed for geographical pockets of oversupply and undersupply in technical manpower.

Table 2: Status of technical education in Mumbai (2008-09)

Sr No	Category	No of institutes in Maharashtra	No of institutes in Mumbai
1	Degree level institutions	172	47
2	Diploma level institutions	174	29

4.1 Problems and perspectives of technical education in the modern scenario

India is today one of the fastest developing countries of the world with the annual growth rate going above 9%. In order to sustain that rate of growth, there is a need to increase the number of institutes and also the quality of higher education in India.

Some of the problems and perspectives of technical education in the modern scenario can be summarized as follows –

- Rigidity in government policies
- Lack of proper design of curricula
- Insufficient levels of advanced facilities and equipment
- Lack of uniformity (policy, infrastructure, routine administration, etc) among all universities
- Lack of finance to support advanced projects due to poor industry linkages
- Lack of necessary aptitude for the course among the concerned students
- Lack of motivation because of inadequate or assured employment opportunities at the end of the course
- Changing mix of urban and non-urban background of students without corresponding modifications of educational methods
- Insufficient training after completion of the course
- No proper placement facilities

4.2 Outcome of the increase in technical institutions in Maharashtra

The booming growth in the number of technical institutions has led to particularly acute issues and concerns for the engineering sector, where colleges are struggling to hire adequately qualified faculty, graduates are failing to find employment and regulators are under pressure to improve standards

The U.R. Rao Committee was established in 2002 to review the performance of the AICTE. The report 'Revitalizing Technical Education' describes the proliferations of technical institutions, geographical disparity, mismatch between student skills and industry requirements, deficit of faculty and accreditation. It appears that the courses at present offered, based as they are on urban aptitudes, situations and characteristics, tend to cater to the needs of the elitist group. A majority of the students face problems in relating to other students because of the language barrier, communication skills, inferiority complexes, financial status etc.

5. REVIEW OF LITERATURE

The four major areas of literature review were Technical Education, Planning of Libraries, Academic Libraries and The Future - Libraries and the Librarian.

5.1 Technical Education

R.Chandrakanth[1](2005) maintains that the increase in the demand for technical education is responsible for the increase in the number of technical colleges in the country. In some cases the norms and standards of the A.I.C.T.E. may not have been adhered to. Pai[2](2006) states that on one hand the establishment of more technical institutions is the need of the hour. On the other hand, in the present set up, technical institutions are not able to meet the existing demands of industry. Pai also suggests that funding by the HRD ministry could change the collections in libraries by increasing the subscriptions to e-journals and moving towards digital libraries – a dream of many librarians.

5.2 Planning of libraries

Planning is one of the most important project management and time management techniques. Sackett[3](2001) advises librarians to think of wireless technology as imminent in most libraries of the future. Varatharajan and Padhi[4](2004) caution that library space will now have to be planned to accommodate computer workstations, scanning equipment and other user driven technologies. McNicol[5](2005) states that the level of library involvement in the institutional planning process depends on the attitude of the management and approach of the librarian.

5.3 Academic libraries

Today with the widespread network of Information and Communication Technologies, academic libraries are now repositories as well as access points for information in the print as well as non print form. Singh and Murthy[6](2002) reiterate that doorways to libraries are becoming gateways to the world. The availability of technology and expertise, funding from governmental agencies and formation of consortia should motivate librarians to take an initiative towards the formation of digital libraries. According to Kataria[7](2007) in the current ICT scenario a Library can be defined as a digital classroom. According to Kappar[8](2007), the National Knowledge Commission believes that ICT applications should be promoted in all libraries and catalogues of all libraries should be put on the web. Mitchell[9] reiterates that adherence to Ranganathan's laws will continue to provide the best guide to achieving the ideal library in the 21st century. Chochrane[9](2007) in her paper stresses that traditional role of the library has not disappeared, it has only changed and it is only librarians can bring order to the information chaos swirling all around.

5.4 The future- Libraries and the Librarian

Swarna and others[10](2000) reaffirm that in recent years technology has made tremendous impact on every profession including Librarianship. Library professionals need to publicize their image as

global, collaborative and proactive information experts. Sreenivasulu[11](2000) highlights that digital librarian today acts as guardian of the information superhighway. Ramzan[12](2004) through his study has revealed that awareness of the potential of I.T. and recency of attaining professional qualifications had a significant relationship with the librarian's attitude. Gandhi and others[13](2007) reiterate that in the digital era, the librarian encounters the twin challenges of managing the print collections and simultaneously developing digital resources and network based information services. Today's librarians are in the most favorable position to be the leaders in developing an information literate community.

Naik[14](2007) asserts that the present librarians have to stay relevant and transform themselves into value adding knowledge professionals. Hatua[15] underlines the fact that the changing role of libraries today also presents a changing role for the librarian. Librarians must be ready to assume various roles in their desire to provide knowledge to users.

6. RESULTS

The following are the results of the survey conducted –

6.1 Involvement of the librarian in setting up of the library

The first part of the survey gathered information about the involvement of the librarian in the planning and setting up of the library. The following data was obtained and analyzed.

Table 3: Categorical involvement of the librarian

Categories of involvement	*Yes*	*No*	*Not sure*
Submission of Proposal	71.42 %	28.57 %	0 %
Architectural planning and interior designing	71.42 %	28.57 %	0 %
Consultation with regard to furniture & equipment	85.71 %	6.25 %	0 %
Sufficient Funds	71.42 %	6.25 %	14.28 %
Management Support	85.71 %	7.14 %	7.14 %

A majority of librarians had submitted written proposals, were involved in the architectural planning and interior designing of the library, were consulted with regard to furniture and equipment and were provided with sufficient funds needed to set up the library. This shows that engineering college librarians play a major role in this process. However in the current electronic scenario, librarians need to transform themselves into value adding professionals by their knowledge and skills.

6.2 Norms and standards of the governing bodies

The librarians were probed about governance, awareness and fulfillment of the norms and standards of AICTE.

Table 4: Norms and Standards of AICTE

No of Respondents	*Yes*	*No*	*Not sure*
Governance of AICTE	100 %	0 %	0 %
Awareness of Norms	90.62 %	0 %	9.37 %
Fulfillment of norms	56.25 %	15.62 %	28.12 %

All the engineering college librarians (100%) were aware that their college library was **governed** by the AICTE. However only 90% of them were actually **aware** of what the norms and standards of A.I.C.T.E were and only 56 % confirmed that they had **fulfilled** the norms.

6.3 Infrastructural details of the library

According to the AICTE, the norms for space has been arrived at, based on the functions that a technical college library has to perform.

Table 5 : Total area of the library

Data Range (in square meters)	*Frequency*	*% of respondents*
Less than 400	8	25.00 %
400-500	8	25.00 %
501-600	9	28.12 %
601-700	5	15.62 %
Above 700	2	6.25 %

According to the AICTE norms, the minimum required area for the library is 400 square meters. From the above table it can be assumed that around 25% of engineering colleges failed to fulfill the norms of AICTE with regard to total area. When the minimum requirements itself are not fulfilled, it is difficult to visualize expansion related to growth in terms of users and services of the library.

Many librarians themselves are aware of the insufficiency of library area... This may be due to an acute constraint of space, a lack of awareness on the part of the persons involved in the planning and designing of the library, decision on the part of the management, non involvement of the librarian or lack of foresight with regard to growth of the library.

6.4 Journals and project reports

In academic libraries, journal collection development supports the curriculum. In an age where journals costs are prohibitive, where the print has to compete with online subscriptions and AICTE norms have to be met with, the analysis of data provided the following information.

Table 6: Respondents by number of national and international journals

Data Range (no. of journals)	*% of respondents (National journals)*	*% of respondents International journals)*
0	3.12 %	9.37 %
1- 20	25 %	31.25 %
21- 40	50 %	12.5 %
41 - 60	18.75 %	18.75 %
Above 60	3.12 %	9.37 %
Not specified	-	18.75 %

The maximum number of colleges (50%) subscribed to 21- 40 Indian journals

Table 7: Respondents by number of project reports

Data Range	*% of Respondents*
0	40.62 %
100- 200	25 %
201- 300	12.5 %
301- 400	0 %
Above 400	15.62 %
Not specified	6.25 %

40.62% libraries did not have any Project Report in their collection and 56.25% colleges did have project reports in their collection.

6.5 Computers, Automation and Library software

The respondents were queried about the total number of computers in the library, library automation and the software used for automation.

Table 8: Respondents by number of Computers

Data Range (no of computers)	% of Respondents
1 – 10	59.37 %
11-20	25 %
21-30	9.37 %
More than 30	3.12 %

Majority of the libraries have about 6-10 computers in their library. These figures imply that all librarians are aware of the importance of Computers and ICT.

Table 9: Library Automation

Responses	Frequency	% of respondents
Not automated	2	6.25 %
Totally automated	5	15.62 %
Partially automated	23	71.87 %
Plan to do so soon	2	6.25 %

The above table shows that most of the libraries are partially automated. It is a sign of good progress and implies that both the management and librarians are aware of the importance and efficacy of library automation. However the fact that these libraries are only partially automated suggests that librarians need to take a more important role so that every aspect of library functioning can be computerized.

Table 10: Library Software used by different engineering college libraries

Type of library software	Frequency	% of respondents
In-house	7	21.87 %
Soul	7	21.87 %
Slim++	4	12.50 %
Libsuite	4	12.50 %
Others	7	21.87 %
Not applicable	3	9.37 %

The above findings show that there is no standardization with regard to library software used by engineering college libraries.

6.6 Level of Computer literacy of Librarian and User

The modern librarian needs to know not only technical skills and knowledge of computers but also communication skills. To the query as to whether the respondent considered himself/herself to be computer literate or not, the following answers were obtained.

Table 11 : Respondents by level of computer literacy of librarian

Level of computer literacy	*Frequency*	*% of respondents*
Computer literate	26	81.25 %
Not computer literate	0	0 %
Just enough to get by	6	18.75 %

All the librarians (100%) believed that today's library needs Computer and Communication Technologies. They knew how to operate Computers. It shows that librarians are willing to change with the times and accept computers as a parallel media for knowledge exchange.

6.7 Type of Catalogue

The conventional system had catalogue cards. This was followed by the printed catalogue. Today most automated libraries use OPAC. With respect to the type of Catalogue provided to users most of the libraries (87.5%) provided OPAC facility to the users for retrieval of information.

Table 12 : Respondents by Type of Catalogue

Type of Catalogue	*Frequency*	*% of respondents*
Catalogue Cards	0	0 %
OPAC	28	87.5 %
Other catalogue	2	6.25 %
No Catalogue	1	3.12 %
Not specified	1	3.12 %

6.8 Bar - coding facility

With regard to the query whether bar coding was implemented for issue/return of books the following answers were obtained.

Table 13: Bar Coding of Books

Bar coding	Frequency	% of respondents
Yes	17	53.12 %
No	8	25 %
Soon to be implemented	7	21.87 %

This shows that most libraries (53.12%) are at-least partially automated and possess scanners for reading bar coded books.

6.9 Online library subscriptions

The librarians of engineering college libraries were asked about subscriptions to online databases like DELNET, AICTE-INDEST consortium, IEEE, ISTE and CSI.

Table 14: Data concerning library subscriptions to Databases

Type of subscriptions	% of Yes respondents	% of No respondents
DELNET	31 %	69 %
INDEST	59 %	41 %
IEEE	72 %	28 %
ISTE	19 %	81 %
CSI	13 %	87 %

Majority of the libraries (59%) are members of INDEST-AICTE Consortia. About 72 % subscribes to I.E.E.E. and about 31% are members of DELNET.

7. DISCUSSION

In this study on 'Planning, designing and setting up of a technical college library with respect to infrastructure, collection development, automation and e-resources: A Study' it has been suggested that the librarian should assume a most important role in the planning and setting up of the library. Librarians should be provided with sufficient funds and support from the management during the initial process of setting up of the library. All engineering college libraries should possess a copy of the book of norms and standards of the A.I.C.T.E and should follow the norms in the setting up of the library. The norms for the minimum total area of the library i.e. 400 sq meters should be adhered to.

It is suggested that the A.I.C.T.E. reconsider the minimum number of books and journals required at the start of the engineering college. It is not easy to procure this vast volume of books and journals in a short span of time. As a result books bought in a hurry and without recommendation from faculty and experts often lie unused on the shelves. The A.I.C.T.E should insist that project reports form an important part of the repository of the institute. A soft copy could be maintained with the help of free software like Dspace. Librarians should be encouraged to procure and provide CDs to users as an essential part of the library collection. User friendly, low-priced and effective library software needs to be distributed by A.I.C.T.E.

It would be beneficial to engineering college libraries if the A.I.C.T.E could provide grants for the purchase of computers and library software. Also training programmes on the use of ICT could be conducted for librarians from time to time. This would enable libraries to be equipped with the latest technologies to create a Library web page, develop a Web OPAC and provide online help to users, whenever required.

8. CONCLUSION

The setting up of an engineering college library requires space, infrastructure, furniture, books, personnel and a host of other requirements. The norms and standards of A.I.C.T.E. have to be taken into consideration. The present survey has revealed that most libraries are aware of the norms of A.I.C.T.E and it has established that the librarian is an important member of the planning committee of the institution.

In today's age both print as well as non-print media co-exist side by side. In fact most publishers offer an accompanying CD along with a book. The Internet and its vast treasury of resources can never be over estimated. The latest technologies like Bar Coding, Web OPAC's, Digital library, RFID technology have changed the way in which the present library is perceived. This study has proved that modern libraries have to be set up and managed according to modern practices, considering advances in computer and communications technology and diverse information formats.

This study has brought to the forefront the changed role of the library in the digital era coupled with the changing role of the librarian. Librarians today realize the advantages of automation, the importance of CD-ROM's and the necessity of access to online databases. However they need to plan for the future in terms of growth of collections, users and services.

In another way, the rise of digitized information is an opportunity to elevate the role of librarian and leads to the emergence of a new breed of librarian: "The Cyber Librarian" or "Cybrarian" - a

specialist in locating information on the internet. Librarians need to see themselves and their libraries as providing bridges to the past and gateways to the future. They need to establish partnerships, coalitions, and connections - technological, personal and organizational - to ensure a central role in the 21st century.

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Quality Library Management: The Key Principles

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1. INTRODUCTION

Libraries and Information Centres are at the crossroads today. The published works that used to be housed in these centres of learning are not entirely becoming available now in the print form. The online sources are increasing and becoming available to users directly. The relevance of libraries is diminishing as the librarians are not able to play the same old roles as the disseminators of information and knowledge in the present times. In the past the knowledge about published resources was available with them on their finger tips. This is not happening now as published and online works are large in number. Technologies used in the past were mostly manual and simple but today they are complex and the librarians and information officers have to depend upon computer, communication and network experts for support. These new technological developments have put the libraries and information centres at the crossroads today. In this paper I am highlighting the issues that confront the libraries and library professionals today in offering quality library services and in the process am trying to evolve the key principles that should guide us in offering quality library services in future.

2. OBJECTIVES

According to Unesco, the objectives of libraries are to inform, educate, sustain literacy, provide useful entertainment and promote the reading culture through a variety of promotional activities.[1] Michael Buckland[2] affirms that the mission of the libraries is to serve the mission of their institutions. Thus the objectives of the libraries change from institution to institution. If we accept Buckland's definition the public libraries support the furtherance of democratic and civil society and the research libraries, in addition to serving their institutions, support the preservation of the human record. In order to work on the objectives, the libraries need to acquire information or access it, organise it, make it available to users and preserve it. In the changing scenarios of information and knowledge, the objectives of libraries and information centres need to be expanded. Quality information and knowledge need to be made available to users from physical and virtual sources available anywhere in the world. We therefore notice that:

I ***A library is a centre of learning that processes information into knowledge, provides or facilitates access to knowledge resources available anywhere in the world on topics of interest or importance to the institution or users it serves.***

3. INFORMATION

Information can lead a user to new knowledge and knowledge in turn can result in the creation of massive sources of information. While the growth of information is inevitable as a result of networking and access to Internet resources, the growth of knowledge is also inevitable. We notice that several scenarios emerge in the growth of information. And, these include the following popular statements:

Online information doubles every 6 months	[3]
Unstructured information doubles every three months	[4]
Corporate information doubles every 18 months	[5]
Medical information doubles every 19 years	[6]
Scientific information doubles every five years	[7]
Biological information doubles every five years	[8]
Useful genetic information doubles every 18-24 months	[9]

We notice that there is enormous growth of information taking place, To this is added the dilemma of accuracy. Accuracy of information is important. Even in the printed literature we have noticed inaccuracies in the works from time to time, but in online sources any one with computer facilities can publish any text without getting it edited for accuracy of language and content. However, guidelines have been published for evaluating Internet information. [10, 11] Don Fallis observes that these guidelines provide the indicators of accuracy. Fallis adds that it is not only inaccurate information which is harmful, incomplete information can also be equally damaging. [12] Thus it is accuracy and comprehensiveness of information which is essential. Though Internet, by virtue of its expanse attempts to be comprehensive, but its comprehensiveness is fragmented and it is the Librarian / Information Officer who has to convert the fragmented bits of information on the Internet into their real comprehensive character.

This growth scenario in the Internet era makes the job of libraries more complex. To make information relevant, it has to be accurate and be based on knowledge. The evidence based medicine, for instance, comprises information which is locally available along with the information collected from external databases and sources. This new trend makes it necessary for librarians to depend upon external sources and play a positive role in fulfilling the objectives of their institutions. We notice that in hospital libraries, the librarian has to be up-to-date while offering information. The playing of this vital role in hospitals makes medical librarians more important. We notice that:

II ***The information the librarians offer should be comprehensive and accurate, and, in key sectors, it should also be useful for decision making.***

4. KNOWLEDGE

It is important to make a distinction between information and knowledge and in doing so I may refer to the definition given by Fritz Machlup. "One may with good reason, insist on distinguishing "information" from "knowledge" by having "information" refer to the act or process by which knowledge (or a signal, a message) is transmitted. Even when the word is not used for the act of communicating but for the contents of the communication, one may want information to refer to the knowledge currently conveyed by that act in contrast to the knowledge previously accumulated in the knower's mind or records."[13] Using this definition data can also transmit knowledge, so would the messages which may not be in the written form. I prefer this definition because it opens out the vistas for culling out knowledge from information.

While information is growing fast, so is knowledge. Knowledge can be used for the transformation of a society. And for that purpose, the use of knowledge becomes essential . So does its management. Our objective in libraries and information centres is to achieve quality management of knowledge. This means that the librarians and information specialists will have to manage information extremely

well to attain quality knowledge for use. Knowledge which is scattered in the minds of people, information and data has to be managed for distilling quality knowledge.

Every day the relevance of knowledge is increasing and so is its volume. We have the following figures that reflect the phenomenal growth of knowledge:

- The world's knowledge doubles every six months [14]
- The sum total of human knowledge doubles every two to three years [15]
- Printed knowledge doubles every eight years [16]
- Technical knowledge doubles every three years [17]
- Medical knowledge doubles every seven years [18]
- S & T knowledge doubles every decade [19]

While knowledge is growing rapidly, as noted above, librarians can play a major role in creating quality knowledge resources by capturing, selecting, processing, storing and disseminating knowledge. All this needs to be done considering the needs of users in each and every library.

Sharing of knowledge is going to significantly grow as a global phenomenon and developed countries could play a significant role in this work, for, in a knowledge society, knowledge is power, and sharing some of it for whatever reasons would be of help to developing countries. This could be achieved systematically, and this should result in a chain process of learning skills and faster and sustainable development. While sharing methodologies will change from location to location or from urban to rural settings, collection and selection methodologies will depend upon the use of sophisticated technologies.

In India sharing of knowledge has been done through diverse modes including discussions, debates, professional meetings and practical workshops. In the Internet era the information and communication technologies offer unprecedented opportunities to disseminate knowledge rapidly to people, wherever they are.

III ***Since sharing of knowledge is a key factor in modernisation and networking, the new technologies should integrate with the existing technologies promoting collaborative and open environments.***

The knowledge can be captured through electronic databases, audio and video recording for storage and dissemination purposes. This knowledge could be on a variety of relevant issues including health, education, government information, industrial information, marketing, etc. This can boost new expertise and knowledge-based organisations.

IV ***Support research and promote links between the units of knowledge to create knowledge.***

V ***Knowledge-based organisations will grow in number for sharing of quality knowledge more widely and cheaply.***

VI ***International standards for creating quality content need to be adhered to and modified, when necessary while maintaining operational relevance.***

The question arises, how do small libraries handle knowledge. This is an important issue that deserves special attention. As there is a phenomenal growth both in information and knowledge, the libraries need to specialise in converting information into knowledge in their chosen spheres. In doing so they need the support of subject experts and system experts. They will have to analyse information to derive meanings and interpret it in order to cull out knowledge. The libraries have to be such centres of learning where knowledge is disseminated for application in institutions and society.

VII ***New digital technologies replace old technologies. Libraries should be prepared to adopt and upgrade them regularly.***

VIII ***In a knowledge society, IT applications, including multimedia presentations should be synchronised and prioritised for capturing and disseminating quality content to serve users' needs.***

5. LIBRARY RESOURCES

There is a limit to buying every document in which a library is interested. This is so because of increase in costs of publication, limited budgets and storage capacities in the libraries. It may be important to note that:[20]

a. There is 12 per cent inflation rate in scientific publications;

b. The number of scholarly monographs is decreasing while their costs are increasing;

c. The cost of quality online publications is increasing, unless made through a library network or a consortia. As such:

IX ***The dependence on direct purchase of non-core documents should go and it should be replaced by resource sharing of documents through library networks.***

6. IT INFRASTRUCTURE

All libraries may not be able to afford the use of high performance computing facilities and all libraries may not need them. However, the incorporation of multimedia-based learning and teaching tools would necessitate the need for better hardware and support facilities. Such an infrastructure would also help in establishing gateways and better access to online resources. The hardware purchased today will be outdated tomorrow, as we notice that:

Our mechanical capacity to process information doubles every year [21]

Capacity of chips to hold information doubles every 18 months [22]

We find that the fast technological developments are blending information, communication and telecommunication technologies. As such with the use of mobile phones, handheld computers and DigiTVs information can be accessed from any part of the world and not necessarily, only in a particular library. This trend reveals that the library is losing the central position for offering information.

The purpose of using new technologies is to enable better acces to quality information. Since a substantial amount of information is available in the digital form, library professionals and users should be conversant with the changing nature of digital resources. The access should be coherent and logical and solid technical support should be regularly available. The technical support should cover a variety of formats, search strategies, data archiving and handling techniques for culling out quality information.

7. ELECTRONIC RESOURCES

Today the greatest dilemma is created by the undependable quality of the Web resources. On one hand, they may be subjective in nature, unreliable and mostly self-published, on the other, they do contain useful information. To sift through the Web resources for quality information is increasingly becoming difficult and there has to be a global effort made to identify quality content in these sources for research and reference.

X ***Contributions on the Web are as scattered as collective human consciousness. It is a valuable source of information that needs processing for knowledge all the time.***

XI ***The creation of useful knowledge from Web resources and published and unpublished sources on given subjects will determine the core competency of a library. Proper management of its use by interested users will unquestionably make it a useful institution.***

8. QUALITY LIBRARY SERVICES

A library has to identify its core materials and core competencies in its specialised disciplines/s. While this affects ordering books, subscribing to journals, online publications and library networks, it also means such a library should undertake research in selecting Web resources on a particular subject and gain competency in that field.

The methods of offering high quality reliable and user-friendly library services will be different in different types of libraries. Library services conducted in the past such as selecting, acquiring, managing/ processing and disseminating information are still valid today in the digitised environment. Today we need to package information in a more selective manner because the digital resources are vast and diverse in nature. The digital resources can include any type of document including the networked resources, multimedia resources, etc. Therefore it is the evaluation of information that is important before packaging it and once delivered it should prove to be useful and productive to the user.

Libraries should thus create portals on quality information in order to make reliable information sources accessible through the Web. The availability of reliable and accurate metadata is also going to be a major characteristics of a good online resource. The libraries as disseminators of reliable information are going to be important in the digital environment. The reputation of a library will depend upon this aspect and on how it publicises its services. The sysnchronisation of knowledge and information resources with users needs will make the roles of librarians meaningful.

The management of quality library service in libraries changes from one type of library to another. It would be important to oversee the present condition of our libraries and the demands of their users, especially in case of public and academic libraries.

Most of the public libraries in India do not function as public libraries in the real sense. There is a need to maintain active contacts with the public on one hand and local administrators on the other. An appropriate library and management strategy could transform a public library into a knowledge centre. The public library, thus, could play a major role in the society. The public library could become an active agency for introducing change in society. This would give it a prominent place and attract sufficient financial resources from both the public and the government.

XII ***A public library should serve as a centre of knowledge for the public and be able to offer knowledge service on any topic of interest to the public.***

The university libraries will have to consider the growing interests of universities in distance education, pressures for raising additional revenues, decreasing competencies in teaching new technical courses, global competition in offering better education and degrees to students and the diminishing relevance of campus education. Thus the university libraries should invent effective roles in these spheres of competition and contribute to the professional excellence in a university system. The other factors that are of concern include:

a. High quality courseware will become available online free or at a nominal charge. This will affect the existing textbook sections in the university libraries; and

b. As good content will become increasingly available online, the use of university libraries by students and faculties will proportionally fall.

Thus it is important that the university libraries deliver processed and quality information to students and faculty which they would not be able to get otherwise.

XIII ***The university libraries should make available online educational and networked sources of information, promote the use of best courseware, specialise in mining quality educational and knowledge resources and make them effectively available to faculty and students.***

9. HUMAN RESOURCE

The majority of professional staff working in Indian libraries today need to be more conversant with information and communication technologies. While training programmes are being organised by some institutions, they do not affect most of the professional staff. While change is inevitable it can not happen without skilled professional and technical staff. If the existing staff does not learn the skills and there are no new openings, the library can not be modernised unless they offer the jobs to an efficient outside agency in this field.

Encouragement and incentives to the existing staff for being trained and the use of part-time technical staff for certain core competencies can also bring in transformation. Thus each library will have to evolve a system that is flexible in modernising a library. This flexibility should be in acquiring new skills by staff, promoting creativity through innovative programmes among staff and incorporating activities that introduce change in the library.

We have to consider that without adopting new technologies and possessing expertise in running them the libraries can not be modernized. The staff that has to be responsible for creating quality content and providing quality library service have to adopt at least the following principles:

XIV ***Librarians should catalogue and process vast amounts of digital raw and processed information and create knowledge products out of them.***

XV ***Develop information technology, communication and critical assessment skills.***

10. RESOURCE SHARING

One of the major tools of quality library management is an efficient resource sharing plan. Every library should manage to develop a resource sharing plan by joining a local, national or international library network. This would in fact supplement and complement the information usually available in a single library. The library network the library joins should be reliable, cost effective and efficient in offering services. It becomes imperative in this day and age for each library to join a library network.

11. DIGITAL PUBLISHING

While digital libraries use scholarly and scientific publications, they do not create them. They should be handiing publication of such works in the digital form and thus be part of the digital environment. Libraries could select high quality publications, arrange to edit them, supplement them with notes and

bibliographies and publish them on the Web. This could usefully be done by the librarians of academic and research libraries. The librarians in such situations, can as a result, play major roles in academic planning and promotion of creative content.

These days students and teachers use sizable Internet content for study and research, and it has been noticed that at times some of them download such content and present it in papers and publications as their own. They commit copyright violations. The librarians could educate such students and teachers about the intellectual property rights and copyright and help them to produce high quality original publications.

12. LIBRARY FUNDING

Quality library services can not be provided unless there is sufficient funding available for a library. There is a need for libraries, especially academic and public libraries, to evolve business models so as to generate additional funds. The business models would need to take into account the following parameters, besides the regular grants each library receives annually from supporting institutions:

XVI ***Information access given to every library member should be equal in all respects unless the information has been packaged for a specific user.***

XIV ***Packaged information be produced for users at a special price. Attract special groups like industries to receive packaged information.***

XV ***Online publishing of the works of importance would have to be achieved.***

XVI ***Create IT/software products for greater use.***

13. TRAINING

Training of staff and library users needs to be undertaken on a regular basis. Nowadays no training on a subject is perfect as new technologies are adopted periodically to time to handle issues more effectively. Thus the impact of training does not remain for ever. However, that only means that one should get trained from time to time in order to be conversant with the latest technologies. One should select a training programme which would be relevant for some time in future.

The upgrading of information management skills regularly using multimedia and telecommunication technologies, and the technologies used in networking and library automation are necessary for every library professional.

14. THE USERS

Users comprising students, teachers, specialists, researchers and the general public frequently use Web resources for reference all the time. While that does not give the ultimate answer to their questions, the libraries will have to attract the users by offering special content to them whether available in their own libraries or elsewhere. The libraries should also provide training to users in using the printed resources and online resources.

As it is going to be difficult for the users to find all the relevant information on their own through the Web, the users would appreciate being trained in making search strategies and in the use of search engines.

XVII *The public will use the Web resources for general queries, while the specialist will be attracted to a library only if quality packaged information is available for him in that library.*

15. KNOWLEDGE-BASED SOCIETY

The slow emergence of the knowledge-based society has necessitated that access be provided to quality resources of knowledge. Information is also needed while knowledge-based skills can be learnt. As the knowledge-based society has been receiving knowledge inputs through knowledge resources including the Internet, the quality library service would demand selection of better documents, the quality service and the orientation of users in IT applications.

XVIII In the knowledge society the synchronisation of the networked knowledge and the networked needs of the users will have to be achieved while disseminating knowledge.

16. LIBRARY OF THE FUTURE

The libraries in future are going to be mostly dominated by the digital and virtual resources, while printed documents, books, journals etc. will continue to play their modest but essential roles. For special users such as children, and specialised subjects like art and printed documents will continue to be preferred. Each library, in order to survive, will have to provide quality service to a user from any part of the world. The technical infrastructure will be user-friendly, using global standards for a flawless flow of information. The factors for success will definitely be determined by maintaining quality in all respects including resources, services, use of management skills, creation of local content etc. Each library will have to specialise in a subject or a type of service using the best management skills.

In future libraries and library networks will have to provide customised services to the clientele at their places of residence. The knowledge centres and the functional libraries will have to contribute to the development of the knowledge society by offering knowledge on any issue including skills. While libraries, networks and knowledge centres will specialise in collection, storage, retrieval and preservation of quality resources, the mode of communication with other libraries and users will be through electronic communication. Each library and centre should make efforts in the following ways:

XIX *Expand existing dependable specialisations and services;*

XX. *Develop links with networks for using resources globally;*

XXI *Maintain business models which are replicable;*

XXII *Answers to users' queries or arranging answers to them through other sources develops strong bonds between librarians and users.*

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Reaching the Remote User: Library Web Site as a Low Cost Solution

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Abstract: Internet is the world's fastest growing repository of data. It is a repository of global information resources. The internet became a major medium in the information world. Today's Internet has grown far beyond its original conception. The world became global village so if any library wants its recognition or reaches its services to users globally the creation of library website is necessary. The organization structure and content of website varies from library to library. We have given here few screen shots of library web-site developed by the authors that contains the pool of information for user access. This paper is made an effort to give tips on how one can develop the library website using HTML tags at no-cost for library services. It also describes the tools one can need, the process of uploading website on internet, list of free web hosts, and the process of transferring web pages to server. This paper is basically focused on college librarians who have little knowledge on HTML tags.

1. INTRODUCTION

The websites of different fields like banking services, news, business etc. made great impact; library and information science also made good impact in its services and reached its users far away places. Librarians are using the web for their professional communication, research and other educational activities. Librarians involved with the development of a library web site and need to understand how web documents are created and structured. People make a mistake of thinking HTML is for computer professionals, but it is in fact for everybody so it is for librarians working in the colleges too. Anyone who has a basic understanding of HTML and a few easily available software tools can readily create the web site of his own. That is exactly what this paper is about. Some tips you will need to know is covered, including you need to know to put your page up on the web.

2. WHAT YOU NEED TO BEGIN

You don't need to be a computer expert, but you should have a working knowledge of basic Windows operations, such as using File Manager or Windows explorer to create copy, move and delete files or folders. You should also know how to switch between Windows applications. This paper is prepared under the assumption that you already know how to use a web browser and navigate on the web, so you should know how to download a file or program from the web. Because many programs on the web are in compressed format – ZIP or TAR, for instance you should know how to decompress files using utilities such as WinZip or 7-Zip etc.

You don't need any fancy software tools to create your own pages. At minimum, all you really need is a text editor to create your HTML file and a graphical web browser so you can preview your work. If you want to create your own personalized graphics for your web pages, you shall need an image editor capable of creating GIF or JPEG images. Finally, to transfer your web page files up onto a web server, you'll need an FTP program. Here are some of your choices:

2.1 A text editor

Our recommendation is that you use a text editor and not a word processor to create HTML files. Windows notepad is perfectly suitable for doing this.

2.2 A graphical Web browse

To do the basic HTML tutorial and to create a basic web page, you only need to have a fairly recent graphical Web browser like Microsoft Internet Explorer, Netscape Navigator, Firefox, Safari and Opera.

2.3 An image editor

To create personalized web graphics, you will need image editor that can create GIF and JPEG images like Paint, Microsoft Photo Editor, or free software available on Internet or use any evaluation versions of this kind for your little work.

2.4 An FTP program

Once you have created your first web page, you'll want to be to transfer it up onto the web. The FTP is required to transfer files and folders easily and quickly. The free web space provider allows you to upload a single page at time. It takes much time to upload the files.

3. DO YOU NEED A CONNECTION TO THE INTERNET ?

If you are using Windows 95, 98, NT, 2000 or XP, it is not required that you have a connection to the Internet just to preview HTML files on your local computer. If you are still Windows 3.1 users, however, may need to be connected on the Internet to be able to browse HTML files on a local computer. We believe Now-a-days no one using Windows 3.1 version.

You'll need to have connection to the Internet, of course, when you get around to publishing your web pages to a web server.

4. CREATION OF WEB PAGES

The web page is a hypertext (HTML) document contained in a single file. It is simply a plain text document. All codes are entered into the document as ordinary text. Web page can be any length, although most web pages display not more than two or three screens of data for healthy browsing. If it goes high length it is better to split in to more pages. Then what web site is? It is a term often called for Servers, but any grouping of related and linked web pages sharing a common theme or subject is called as web site. It is in simple way to say as a collection of related web pages. Library web site means the web pages of library related information like Library Introduction, Working Hours, Resources, Services, Monthly Additions, Staff, Databases available, and Rules etc. One can browse Lala Lajpatrai College Library web site developed by the librarian and hosted on free server. The website URL is http://lalalibrary.cjb.net It is still on beta testing. You will come to know how the web pages are created with HTML tags and contents of the web site. Content may be different from one library web site to another.

You can use 'Picasa2' and later version (freely available software on Internet) to export image files as web pages. It creates in a few seconds. Then you can link the page where it suits in your web site. Picasa2 can also be used as image editor. Only limitation is that, it supports just jpg files. First, what one has to do is convert the other image file formats to jpg and then use for web page exporting.

To convert from other image file format to jpg you can use 'XnView' software which is freely available on web.

The text colours and background colours of a web page are essential in web page creation to obtain better view for web pages. These colour- coding can also be done with free software available on Internet. If you are subscribing CHIP, DIGIT, PC Quest or any other computer magazines, you can get free software on HTML color codes. The 'Color to html 5' is one such utility which you can use. Color to html 5 is a small utility for finding out HTML color codes and vice versa. It is very easy to use.

5. HOME PAGE

A home page can serve as an entry point (or front door) to a web site, or group of linked and related web pages. Most servers let you create a default home page, most often index.html that loads automatically without having to specify the file name in the URL. (Other default home page file names may also be allowed – index.htm, welcome.html, and so on – depending on how the server is configured.) This allows you, for instance, to have http://lalalibrary.cjb.net/ as your URL rather http:/ /cjb.net/lala library.html

Home pages used as entryways are often kept small and serving simply as direction to the web pages that make up the rest of the web site. The idea here is that viewer need only display the home page, which is relatively small, and then decide what else to see in the reminder of the web site.

6. FINDING FREE WEB HOST

The first step is to find a server to host your page. If your college is subscriber to one of the online services then it can provide some web space. Your local access provider that connects you to the Internet might also provide web space for free or at a nominal cost. There are also web space providers on the web that will host your pages for free, generally in exchange for placing their ad banner on your page or having an extra pop-up window with advertising open when your page is accessed.

Table 1: Free Web Space Provider

Web Site	Free Space Available (in MB)
www.geocities.com	15
www.50webs.com/	60
www.topcities.com	150
www.complete-free-host.com/accountspec.php	50
www.freeservers.com	12
www.50megs.com/	12
www.freewebs.com	40
www.freewebspace.com	20
www.20megs.com	20
www.t35.com	Unlimited
www.freespaces.com	Unlimited
www.answers.org/	Unlimited

The free space availability changes frequently. Therefore it is better to visit the site and check. You can also find the free web space provider list on http://www.google.com/Top/Computers/Internet/Web_Design_and_Development/Hosting/Free/Personal/

7. TRANSFERRING YOUR WEB PAGES TO A SERVER

Your web host should provide you with FTP (File Transfer Protocol) access to your folder on its server. This means providing you with a user ID and a password, as well as assigning you a password-protected folder on its server where you can store your HTML and other files. You might also be assigned an account name. This allows you to access your folder (and any folders you can create within that folder) through FTP, copying files to or from it, while keeping everyone else out.

Many FTP programs are available on web, and any of them will do the transferring of your files and folders. The following are the FTP programs can do for you

- WS_FTP Pro : This is the professional version of WS_FTP
- Cute_FTP : This is an excellent shareware program that uses an interface similar to that of Windows Explorer.
- HTMLed Pro : This HTML editor also includes the capability of transferring your finished HTML files via FTP.

In this file transferring operation with FTP program one can seek the help of the System Administrator in your college or any library professional who is doing this work.

8. URL REDIRECTION SERVICES

When you set up your site on a free web hosting service, the URL you get wouldn't be very easy to remember. If you've got those long URL and want a shorter or more personal web address, then you could make use of the free URL redirection services available on the web. These sites for instance, replace http://something/ members/~trouble/yourname with www.yourname.cjb.net.

8.1 Some popular redirection services

- www.webalias.com
- www.cjb.net
- www.direct.at
- www.cyberlink.to/
- http://bounce.to/v3home.asp
- http://gonow.to
- www.internetjump.com

9. LAUNCH YOUR SITE AT SEARCH ENGINES

What is the point of having a library site if your users or the world doesn't know about it? So, after you've designed and uploaded your site, it's very necessary to let people know of your library site's existence. One of the most important things you could do to increase traffic to your site is getting listed in the major search engines. There are two ways to do it:

9.1 Automated Submission

There are a few sites on the Net that quickly submit your website to many search engines at once. This is easy, but usually produces only mediocre results.

9.1.1 Sites that do the submitting for you

- http://uswebsites.com/submit
- http://www.netcreations.com/postmaster
- http://addme.com

9.2 Manual Submission

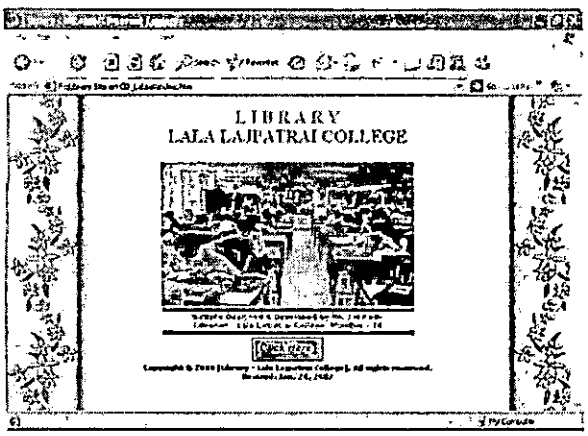
You could submit your site to each of the major search engines, one by one. The sites on the search engines are arranged in various categories like, Education, Entertainment, etc. To submit your site, first select an appropriate category and then click on the "Submit your site" or "Add a URL" button from the end of the category page.

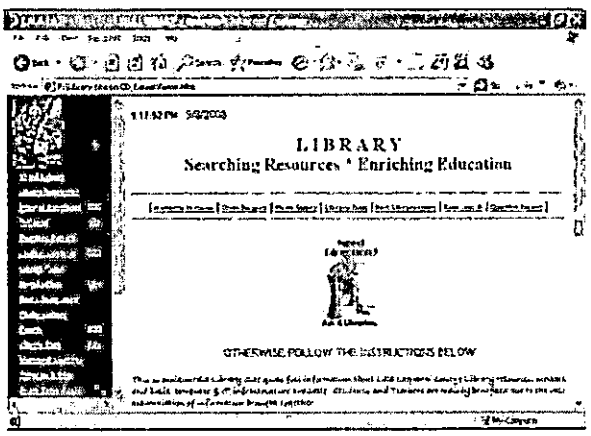
Some of the search engines where you could submit your site's URL are:

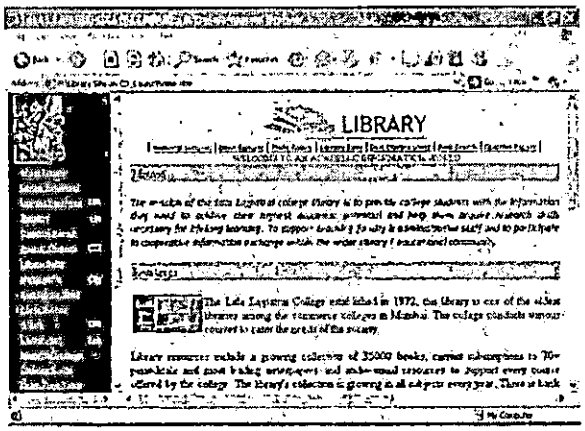
- www.lycos.com
- www.altavista.com
- www.webcrawler.com
- www.infoseek.com
- www.yahoo.com
- www.khoj.com

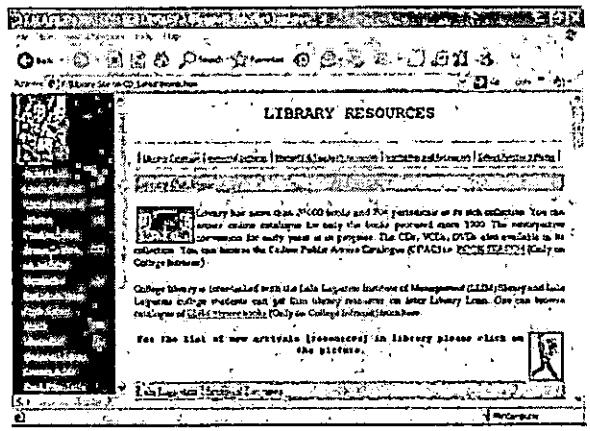
Search engines have their own rules for indexing sites. So, you need to do quite a bit of homework on this. Now you may sit back and look at your library website. Doesn't it give you a delight to feel "Yes, I've done it!" I have achieved some thing with no-cost for benefit of library users. Reaching the remote user with service motto through library web-site bring positive sign in college library fraternity. This is almost with no cost budget we can reach remote ser.

Model of Library Web-Site (Screenshots)









10. CONCLUSION

As world become more connected with Internet, web services are essential for library professionals to understand the general principles of creating and maintaining web pages and its content.

With no-cost concept the library website can be created and hosts like this without investing on web servers and other software. This article it self is not an exhaustive one to create, develop and host your web pages. This article is for college librarians who do not know much about the computer languages but know about the HTML tags. The present article is about how the college librarians can create web pages them-selves and how they can use free software in web page development. There are still many exciting technical advances which are changing the structure of the web. New developments in computer languages such as JAVA, PERL and XML etc. are forcing us to create web pages and think modern way of library services.

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RFID Technology in the Modern Library Scenario

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Abstract: The authors' of this paper have described about the requirement of libraries to sail with the current technology in order to provide effective and efficient services. The paper presents the in and outs of RFID technology for the library and Information system management. Further, the paper explains about the technology, its genesis and the areas where it can be applied in a library system to make the system more effective and user friendly. It gives a complete insight about the components and the application of each component in the library and how by implementing such a type of technology in libraries - the man power, energy, time, duplication of work, and efforts can be saved. At the end highlights the advantages and threats of this technology offers and also briefly covers the use of this technology in India.

Keywords: RFID, RFID application, Automated Library System (ALS), Smart Card

1. INTRODUCTION

Today's changing scenario in the publishing and information technology fields have forced library and information professionals to accept the changing demands placed on the profession today. Libraries are being considered as information and knowledge centres; information needs and seeking behaviour of the users have changed with times, This has posed before the LIS professionals, a challenge and one has to strive hard and make every effort to enable their clients have better and timely access to their requirement of relevant information [(3)]. To be successful in the future, LIS professionals have to suitably change their role. They should not merely act as transactional librarians such as answering readers' queries, conducting orientation programmes, issuing books, etc. They should, in addition, act as transformational librarians; they should have a vision of the future and the opportunities and challenges that their library and information centers (LICs) have to face in the future.

2. RFID: AN OVERVIEW

RFID stands for Radio Frequency Identification. It is an automatic identification method, relying on storing and remotely retrieving data using various devices and is driven by the radio-frequency scan technology. The acronym refers to small electronic devices that consist of a small chip and an antenna. RFID technology does not need an item within line-of-sight for identification. RFID driven system can give additional functionalities such as automatic reading, sending e-mail communications about any event about the item. RFID has been in existence for more than 20 years, and it has been extensively used in applications such toll collection, access control, ticketing, heightened security concerns, supply chain automation and a continuing emphasis on cost control within industrial systems.

3. COMPONENTS OF RFID TECHNOLOGY

1. RFID tags
2. SMART Card

3. Readers or Sensors
4. RFID Antenna
5. Security System pedestals

3.1. RFID tags

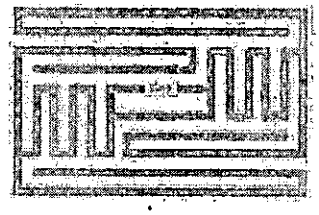


Fig.1: RFID Tag

The prime component in RFID system is the RFID tag; each item is initially filled with RFID tags. The tag uses an electronic radio transmitter comprising of a micro-chip, an antenna and tiny battery fixed on thin – plastic sheet. This plastic sheet can easily by attached to a variety of items directly. The RFID tag has three sections: a lockable section for the item identification, a rewritable section and security function for the item antitheft i.e. which can be activated and deactivated. The chip also has a multi read functions which means that several tags can be read at once.

3.1.1 RFID Tags Are Of 2 Types

3.1.1.a Passive RFID Tags

These do not have their own power supply: the minute electrical current induced in the antenna by the incoming radio-frequency scan provides enough power for the tag to send a response. Due to power and cost concerns, the response of a passive RFID tag is necessarily brief, typically just an ID number.

3.1.1.b Active RFID Tags

They has a power source, and may have longer ranges and larger memories than passive tags, as well as the ability to store additional information sent by the transceiver. The smallest active tags may seem to be of about the size of a coin. Many active tags have practical ranges of tens of meters, and a battery life of up to several years.

As passive tags are much cheaper to manufacture and do not depend on a battery, the vast majority of RFID tags in existence are of the passive variety.

3.1.2. Current Usage Of The RFID Tags

There are four different kinds of tags commonly in use and are categorized by their radio frequency:

3.1.2.a Low -Frequency RFID Tags

Tags (between 125 to 134 kilohertz), are commonly used for animal identification, beer keg tracking, and automobile key-and-lock, anti-theft systems. Pets are often embedded with small chips so that they may be returned to their owners if lost. In the United States, two RFID frequencies are used: 125kHz (the original standard) and 134.5kHz, the international standard.

3.1.2.b High-Frequency RFID Tags

Tags (13.56 megahertz) are used in library book or bookstore tracking, pallet tracking, building access control, airline baggage tracking, and apparel item tracking. High-frequency tags are widely used in identification badges, replacing earlier magnetic stripe cards. These badges need only be held within a certain distance of the reader to authenticate the holder.

3.1.2.c UHF RFID Tags

Tags (868 to 956 megahertz) are commonly used commercially in pallet and container tracking, and truck and trailer tracking in shipping yards.

3.1.3.d Microwave RFID Tags

(2.45 gigahertz), are used in long range access control for vehicles, an example being General Motors' On Star system.

3.2 Smart Card

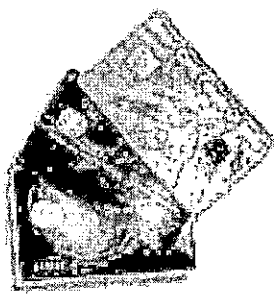


Fig. 2: Smart Card

The term contact-less Smart Card refers to identification cards that do not need to make contact with the readers to be read. This capability is implemented using a tiny RFID in the card.

3.3 Readers or Sensors

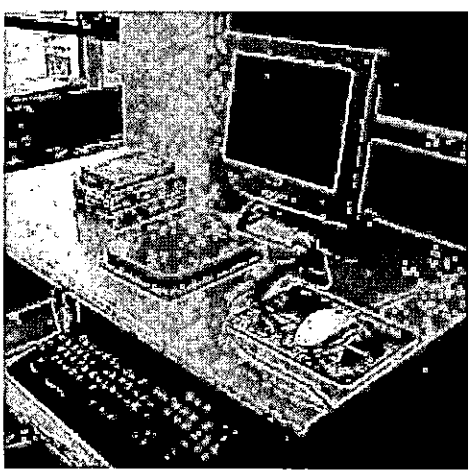


Fig. 3: Reader or Sensor

A receiver device called as Reader detects the signal as soon it enters into its radio-range and decodes the number for interpretation; Reader interrogates the tags and offers optimum reading performance enabling instant data capture when passed alongside the items in a continuance movement.

3.4 RFID Antenna

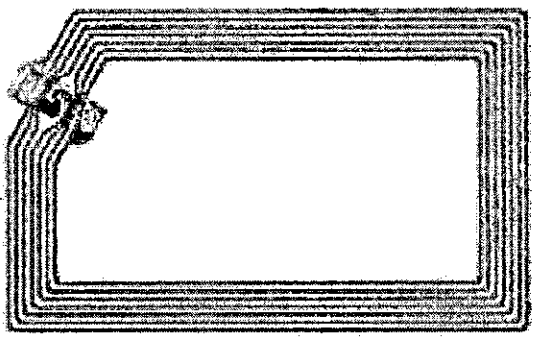


Fig. 4: RFID Antenna

An antenna is connected to the reader to help to process identification of the items and activate/ deactivate the tag antitheft function simultaneously. Additional antenna can be added to increase the number of item processed in case of larger transactions.

3.5 Security System

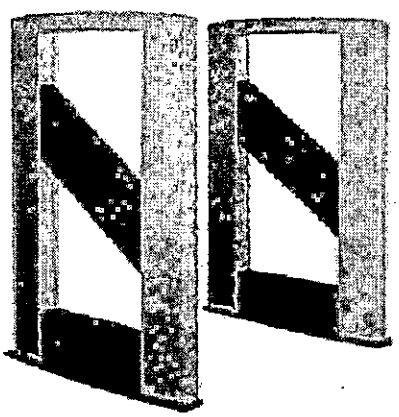


Fig.5: Security System

The security system benefits the latest design innovation to manage RFID and antitheft functions into a single device. A security system is composed of two pedestals; each pedestal is standalone and plugs and play to the main power. New generation pedestals are based on a most efficient mechanical design.

4. APPLICATION OF RFID TECHNOLOGY COMPONENTS IN LIBRARY

Among the many uses of RFID technologies is its deployment in libraries. RFID system adopts all the five components to improvise the library management system in the modern scenario:

4.1 RFID Tags

The all-in-one RFID tag revolutionizes collection management. Tags don't need to be visible to be read, so books and other media can be identified quickly. RFID tag has a small memory in which its unique identification number is stored and it periodically sends out a radio signal carrying and conveying unique identification number. It reduces the repetitive tasks of librarians and helps reduce long queues and waiting lines.

4.2 SMART Card

By using such type of cards the check-in and check-out function becomes easy, accurate and convenient to the research scholars/ library readers. User identification can be easily done through the smart cards.

4.3 Readers or Sensors

The information contained in the RFID tag is read by an RFID reader. RFID reader can perform fast and accurate inventory checks and also search specific documents as re-shelving, weeding, on-hold management.

4.4 RFID Antenna

Items check-in and check-out can be carried out at the highest speed and most effectively; the circulation desk can process 1 to 15 documents simultaneously. The circulation desk can also read RFID reader cards. Library staff has more time to spend advising readers. Queuing time is reduced for optimal customer satisfaction.

4.5 Security System

The security system allows to perform simultaneous reading into the chip and activation and deactivation of the antitheft function. Security system are ultimately library collection gate keeper.

5. RFID ENVIRONMENT

In the RFID environment, the RFID tags are pasted on all the reading materials. Another step involved is programming / tagging of the documents, the documents on which RFID tags are pasted are kept on the reader for authentication of the tag, the tagging is done by feeding the accession numbers, retrieving the data stored from the master database and the authentication of the tag is done by verifying all the data of the concerned document. At the time of check-out the reader reads the data of RFID cards and documents to be issued and simultaneously does the de-activation of the RFID tags passed on the documents for security reasons.

6. PHASES OF LIBRARY RFID MANAGEMENT SYSTEM

There are in general four phases of Library RFID Management System

6.1 Library Security System

- **Phase Action:**

– Using RFID Tag replace Electromagnetic (EM) Security Stripe

- **Phase Target :**
  - Radio Frequency Detection
  - Replace the Electromagnetic Anti-theft system to avoid the high volume EM field harm to human body
  - No False Alarm.
- **Equipment & parts needed :**
  - Anti-theft Detection Gate - Detect the RFID Tag on Book and Check EAS Status, System alarm when the EAS status is ON.
  - Security Processing Station - Turn On or Off the EAS Setting of the Chip / RFID Tags

6.2. Support Library Circulation

- **Phase Action:**
  - Using RFID tags replace the barcode in Circulation process.
  - Reading book's access number from RFID than from barcode to borrow and return the book.
- **Phase Target:**
  - No line of sight needed
  - Allows to check-out and check-in several items simultaneously
  - Performing both identification and antitheft in one single operation
- **Equipment & parts needed:**
  - Counter Station
  - New Integrated Library System functions read from RFID and set the EAS status.

6.3. Patron Self Check-in/Check-out

- **Phase Action:**
  - Let patron do the check-out and check-in process of books.
- **Phase Target:**
  - Benefit to Librarian:
    - Speeds up book check-in / check-out
    - Frees staff to better service patrons
    - Better space planning
- Benefit to Patrons:
  - Easy to use: books can be read in any orientation
  - Reduces queuing time
  - Provides patron privacy
- Equipment & parts needed:
  - Self Check Station - Perform patron self check-out and check-in process and turn off or turn off the EAS status.
  - Book-Drop - Indoor or Outdoor. After patron drop in the book into this station, book's id is checked and turned on the EAS simultaneously.

- Remote Book-drop - Long distance away from library, acquire better protection of the Book-drop.
- Sorting station - Sorting the return books automotive or manual.

6.4. Smart and Quick Inventory

- **Phase Action:**
  - Search and Inventory by reading the RFID using portable reader and portable computer.
- **Phase Target:**
  - Quick inventory
  - Look up the misplace material
  - Search for certain material
- **Equipment & parts needed:**
  - Portable RFID reader
  - Portable Computer - Notebook PC or PDA
  - Inventory & Searching software

7. RFID WORKS BETTER THAN BARCODES

Radio frequency identification (RFID) is fast substituting Barcode/ scan code technology.

A significant advantage of RFID devices is that the RFID device does not need to be positioned precisely relative to the scanner. RFID devices will work within a few feet (up to 20 feet for high-frequency devices) of the scanner.

7.1 RFID technology - entry into the Library system

While there is some debate as to when and where RFID in libraries first began, it was first proposed in the late 1990s as a technology that would enhance workflow in the library setting. Rockefeller University in New York may have been the first academic library in the United States to utilize this technology, whereas Farmington Community Library may have been the first public institution, both of which began using RFID in 1999. Worldwide, the United States utilizes RFID in libraries more than any other nation, followed by the United Kingdom and Japan. It is estimated that over 30 million library items worldwide now contain RFID tags, including some in the Vatican Library in Rome.

7.2 RFID in the Indian context

In the Indian scenario, RFID technology for the libraries is still new, but some libraries have implemented it and in many implementation processes are going on while some are considering implementing it. A survey carried out by Gayas, Makhdumi and Verma, V.K. in all 4 regions of the country (given in table), it is quite evident that the technology is not yet fully harnessed by even the most prominent libraries, (published research paper on RFID implementation in libraries, XXVI All India Conference of IASLIC) - the following table highlights the response to status of implementation of RFID technology.

8. BENEFITS OF RFID

- Combines both material identification and securing into one single tag or transponder, thus saving cost and time.
- Multiple items can be read at a time, resulting speedy circulation.
- Smart labels can be attached to media, such as CDs, DVDs, print and non-print media.
- Tags are read/write, providing flexibility into encoding and decoding.
- Durable tables i.e., designed to lost life time of the item they identify.

Apart from these it would be worthwhile to mention that the technology contributes to meeting the challenges being faced by Libraries of today; mainly the security, manpower, effective and productive services, resource management, and deficient budget

9. THREATS

- Threat to staff of losing job
- Issue of privacy
- Cost prohibitive
- Removal of pasted tags
- Sensor Environment
- Limited Battery life
- Jammed networks
- Lack of standardization

Table 1: Implementation of RFID in some prominent Indian libraries

Region	Libraries	Implemented in process	Implementation implement	Planning to right now	No such plan
EAST	IIT Kharagpur		✓		
	ISM, Dhanbad			✓	
	NIT Rourkela		✓		
	Jadavpur University		✓		
WEST	Pune University Library	✓			
	LRC, BOB, Mumbai		✓		
	PRL, Ahmedabad		✓		
NORTH	Jammu University Library	✓			
	IGCNA, New Delhi			✓	
	JNU, New Delhi				✓
	ICSSR, New Delhi	✓			
SOUTH	IMSc, Chennai		✓		
	IGCAR, Kalpakkam			✓	
	IIT, Chennai				✓

10. STANDARDISATION OF RFID - GOVERNMENT OF INDIA PERSPECTIVE

In India the Ministry of Telecommunication is responsible for the implementation and standardization of RFID technology. The Wireless Planning and Coordination (WPC) wing of India's Ministry of Telecommunication assigned the 865-867 MHZ UHF band for use by radio frequency identification devices. The ruling was part of a process initiated by EPC global India, a joint industry- government initiative that is leading the development of electronic product code to support the use of RFID. Clearing the spectrum in India will enable Indian manufacturers to tag shipments of goods to meet the WHF RFID requirements of customers in Europe and the United States.

Thus, Indian companies will now find it much easier to encode and read tags on goods are bound for the United States or Europe (where the UHF spectrum for RFID is 865 MHZ to 868 MHZ). As far as libraries are concerned, they are using RFID passive tag with the frequency of 13.56 MHZ. There are such guidelines or policy available by the Govt. of India in context of RFID implementation in libraries (By Aug. 2007) [(2)]. Mostly the libraries are dependent on the information provided by the vendors or the specification provided by the libraries where the system is already installed.

11. CONCLUSION

RFID has many applications in libraries that can be highly beneficial, particularly for circulation staff. Since RFID tags can be read through an item, there is no need to open a book cover or DVD case to scan an item. This would help alleviate injuries such as repetitive strain injury that can occur over many years. Since RFID tags can also be read while an item is in motion, using RFID readers to check-in returned items while on a conveyor belt reduces staff time. Furthermore, inventories could be done on a whole shelf of materials within seconds, without a book ever having to be taken off the shelf.

Thus an Integrated Library System (ILS) harnessing RFID technology will convert a traditional library into a Smart library by reducing time at circulation desk and quick inventory control without handling books. The technology is very straightforward, but there are a number of very interesting features, limitations, issues, challenges and technical specification of the system.

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Technical Issues of Handling Oriental Collection: A Case Study of Quaid-e-Azam Library, Lahore

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1. INTRODUCTION

Quaid-e-Azam Library is a high profile research and reference library of Pakistan. It is a non-lending library and caters the needs of research scholars and post-graduate students. It is situated in the pleasant atmosphere of Jinnah Garden, Lahore. The asset of the library is its incomparable collection of books and non-book material.

There is open access to shelves which are provided with shelf guides. Books have been arranged according to Dewey Decimal Classification scheme with certain modifications for subjects like Islam, Christianity, Pakistan and oriental languages and literature (Persian, Arabic, Urdu and regional).

1.1 Brief history of the library

The building in which the library is housed constructed in the mid of 19th century during British rule. It comprises two halls, the Lawrence Hall and the Montgomery Hall. The Lawrence Hall was build in 1863 chiefly from the contribution of the European Community of the Punjab, as memorial of Sir John Lawrence, first lieutenant Governor of the Punjab and subsequently Viceroys and governor general of India. The Montgomery Hall was erected in 1866 from subscription of native chiefs of the Punjab in honor of Sir Robert Montgomery. Both the halls are joined by a covered corridor. A commodious reading room, leading into the corridor between the two halls, was later constructed. The building was frequently used as an assembly room for public meetings and staging theatrical and musical performances. Mostly it was a meeting place for the foreign elites to while away their evenings in summer with iced drinks, and in winter with a log-fire. Both the halls were under charge of the Municipal committee. The building was known as old Gymkhana.

On 17th may, 1981 a committee was formed under the chairmanship of chief secretary, Punjab, to set a model library in Bagh-e-Jinnah, Lahore. The renovation work for converting the old Gymkhana building started immediately thereafter. The president of Pakistan Gen. Mohammad Zia-ul-Haq visited Bagh-e-Jinnah to approve plan on 24th October, 1981. The library was officially inaugurated by president of Pakistan on 25th December. 1984 named was named as Quaid-e-Azam library.

There is a room for appropriately 250 readers who can browse and study in comfort. The floor area of the building is 33 thousand sq. ft. this can easily provide storage space for 0.1 million books. Further extension in library building is in progress.

I have chosen this library to conduct this case study because of its unique oriental collection and technical tools developed by this library for processing of its oriental collection.

1.2 Oriental section of the library

The oriental section is located on the upper gallery of the Jinnah Hall. The gallery consists of four scholar rooms in each corner. Urdu literature covers half of the gallery whereas one long portion has Arabic collection and one small portion having Persian collection.

The total oriental collection is about thirty thousand volumes which contains books on Urdu, Arabic, Persian and local languages i.e. Punjabi, Pashto, Sindhi, Balochi and Kashmiri. The collection in these languages covers all disciplines. More than 80% collection is on Islam, history and literature.

The Arabic collection comprises almost all classical and reference sources on Islam, particularly encyclopedias, dictionaries, important commentaries on Quran, Hadith and Asma-ur-Rijal (biographies of collectors of Ahadith).

The Urdu collection is very rich in poetry, fiction, Pakistan studies and biographies. However, the Persian collection is not remarkable. Two special sections in Urdu literature "Iqbaliat" and "Ghalibiat" have been established. These are specially treated like Shakespeare in English.literature.

2. TECHNICAL ISSUES FOR PROCESSING OF ISLAMIC AND PAKISTANI LITERATURE

2.1 Classification

At the very beginning of the QAL, it was strongly felt that there is no sufficient provision for the classification of oriental and Islamic literature in DDC. Although DDC is a well devised classification scheme popularly used in 80% libraries of world and 95% libraries of Pakistan, yet unfortunately, there is only one solitary number 297 for Islam. It is the second largest religion of the world with 1.62 billion (2007) population spread in 184 countries having vast range of Islamic subjects and interdisciplinary literature. In the same manner, DDC (22nd ed) provides 491.439 and 891.439 for Urdu language and literature respectively. Pakistan has area notation —5491.

A number of efforts were made in different times by many individuals like Dr. Anis Khurshid, Muhammad Ibrahim, Muhammad Sahfi, Riazuddin and others to solve this problem; but unfortunately these personal efforts ends in obsoleteness because these efforts were not done to fulfill the practical need of a library.

In 1982, management of QAL constituted a committee, consisting of Director General public libraries/secretary, BOG, QAL as Chairman and Muhammad Mushtaq, Chairman DLIS, Punjab University, Lahore, Jamil Ahmad Rizvi, Chief Librarian PU, Lahore and Muhammad Taj, Present Chief Librarian of Quaid-e-Azam Library as its members. Main objective of this committee was to make appropriate changes for Islam and some important changes in Arabic, Persian, Urdu and regional Pakistani languages (Punjabi, Pashto, Sindhi etc), and Pakistan, in DDC, without damaging its original notation formation and class structure.

The Committee consulted the pervious works on this topic in which this problem was tried to solve. After efforts of few months, keeping in view the heavy literature on Islam and oriental languages and literature, committee proposed to adopt 220-289 notation of DDC (edition 19) for Islam, 450-480 for Urdu and other oriental languages and 850-880 for Urdu and other oriental literatures to overcome this problem. Proposed classification scheme devised for classification of Islamic literature, oriental languages & literature and Pakistan is as under:

Islam 220 – 280

230- 239	The Quran and Quranic Sciences
240- 249	Hadith and Seerah of Prophet Muhammad (PBUH)
250-259	Fiqah (Islamic Jurisprudence)
260-269	Aqaid & Kalam (Dogma and scholastic theology)
270-279	Sufism
280-289	Miscellaneous

Oriental languages 450 – 480

450	Urdu Language
460	Arabic Language
470	Persian Language
480	Regional Languages (Has been sub-divided for individual languages)

Oriental Literature 850 – 880

850	Urdu Literature
860	Arabic Literature
870	Persian Literature
880	Regional literatures (Has been sub-divided for individual literatures)

The Committee also proposed to use first alphabet of every language and literature for classification of books in English or other European languages. DDC has allowed to use such alphabets.

Urdu Language	4U0
Urdu literature	8U0
Arabic Language	4A0
Arabic Literature	8A0
Persian Language	4P0
Persian Literature	8P0

Geography and History

953	Islamic History
953	History before Bun-Abbess
229	History of Islam as Religion i.e. Islam in Europe is 229.4
95P	History of Pakistan in English language
95 پ	History of Pakistan in Urdu language

Biographies

In case of individual biographies "B" is used but

248	Biography of Holy Prophet (PBUH)
249	Biographies of other Holy Prophets

Collective biographies are placed with the subject using 092 as standard sub-division. For example collective biography of Chemists is 540.92. If no specific subject is defined then the book is placed in "B" (English section), and in "Ó" (Oriental section). Biographies of literary persons are placed with their works.

The classification scheme prepared by QAL is now a practical classification scheme with gradual amendments according to needs. Due to these amendments, life span of this scheme is increasing as well as it use by many libraries. Some libraries in Pakistan using QAL oriental classification scheme are; Iqbal Academy Pakistan Library Lahore, Al-Mawrid Institute of Islamic Sciences and Qarshi Library Lahore etc.

2.2 Cataloguing

When west successfully pervade the structured composition of names, Muslims world beside effort still confused with verity of names practices. Islamic names are different in their composition; new followers of Islam were encouraged to adopt Muslim names instead of Non-Muslim names. As the Islam spread across the globe, the local and tribal identifications also joint the names. This trend some how, complicated the basic structure of names. Non-Muslims domination on Islamic states also reasons major change in Islamic names. Pakistani names, like other Muslims states, are highly dependent on Arabic culture and language with mingling of local trends. That is why; it was said in Paris Conference, 1961 "Pakistani Muslim names need special considerations while cataloging

Muslims names can be consisting of single word to combination of eight words. According to a careful assessment mostly, three words names are used in Pakistan. However, there is no set of structure rules for these names. Due to this, even minor geographical change reverses the order of name's structure. So these names have become complicated and unique in every case while cataloguing. Usually these names include following components:

1. Noun
2. Title
3. Patronymic appellation/ family name
4. Nick name
5. Affinity /attribute / relation
6. Sirname / application of honor
7. Titular name / poetic name / pen name

These elements have been identified by many scholars, but conflicts remain about their arrangement for cataloging. For example Prussian instructions arrange these elements as:

1. Title
2. Family name with "ABU"
3. Noun
4. Family name with "Ibn"
5. Sirname or attribute

To solve the problem and to avoid confusion among Pakistani names, an authority list of authors has been prepared. This list was named as "Authority List of Authors". For Arabic names "Arabic Names Headings" by Swaydan is used. Persian names are treated like Pakistani names.

2.3 Assigning Subject headings

In 1976, four postgraduate students of Library Science, University of the Punjab, Lahore, translated the Sears List of Subject Headings into Urdu language for their thesis work. On the basis of this translation, the committee prepared a list of subject headings to meet the requirements of subject headings for Islamic and Pakistani literature in QAL. This list is also used for assigning to Persian

books. For Arabic collection, the popular subject headings list "Arabic subject headings" by Swaydan which is being used in Arab countries, "was selected to be used in QAL.

2.4 Allotting Cutter numbering

C. A Cutter's three digit table is used to assign cutter numbers. In making a Cutter number, first letter of author and second letter of title is used. If main entry is under title, the cutter number is allotted for title. In case of biography and autobiography, cutter number is assigned for biographee and autobiographee. A separate list based on C. A. Cutter's three digit table has been prepared for assigning cutter numbers to Islamic and Pakistani names.

2.5 Automation of oriental collection

The automation of oriental collections in QAL was started in 1989. A DOS based single user version software namely KITABDAR was used. Later on a network version of this software was developed. In 2003, a comprehensive automation project for QAL was initiated. The multilingual MARC based software being developed through this project delayed and still in the pipeline due to various reasons. In 2005, KITABDAR was replaced with THE multilingual software DGLIB developed in-house for the interim period, which is hitherto working satisfactorily. As this is multilingual software, QAL is running two programs simultaneously.

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Developing an Information Literacy Framework: The Hong Kong experience

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Abstract: The Education and Manpower Bureau of the Hong Kong Government has promoted 'Learning to Learn' as a crucial feature of student-centred curriculum and the educational reforms over the past decade have been directed towards this goal. Recently, information literacy, described as: the ability to master the processes of becoming informed, was identified as the missing ingredient in the reform. Interest in information literacy grew out of a realization that the application of modern information and communication technology and related shifts in curriculum integration and a shift away from textbooks and examinations, was not sufficient to deliver learning to learn.

A study was commissioned by the Hong Kong Government to develop an information literacy framework that would enable teachers of all subjects to infuse education for information literacy across the curriculum. In addition the study sought to identify levels of teacher concern and understanding with respect to information literacy, and ultimately to identify their readiness for its implementation. To achieve these objectives, a region-wide questionnaire survey, focus group discussions and consultation sessions were held. Although a majority of the education practitioners did support the idea of having such framework for all schools, there were diverse opinions and concerns on its implementation in practice.

1. INTRODUCTION

In 1998, the Education and Manpower Bureau (EMB) of the Hong Kong Government announced the five-year strategy which included guiding education practitioners to integrate ICT (information and communication technologies) across the curriculum, and developing learners with lifelong learning skills, knowledge and attitudes. Following detailed evaluations of the success of the ICT rollout (EMB, 2004, March) in achieving these objectives, the EMB proposed a broad framework of information literacy (IL) for Hong Kong students (EMB, 2004, July) and to collect stakeholder reactions regarding the implementation of this framework. A task group was commissioned by the Steering Committee on Strategic Development of Information Technology in Education to establish a framework for these tasks and eventually consultants were engaged, via a tender process, to manage the project.

1.1 Literature Review

Studies of information literacy and schools from around the world have informed IL scholarship. In Canada, a study has determined that soon, approximately half of the Canadian workforce would be employed in information-based jobs (Ontario School Library Association, n.d.). The 21st century has spawned a digital culture in which information can be readily accessed on the Internet. The Internet has become a primary searching tool as well as a motivational force driving people to equip themselves with skills in using information and communication technologies (ICT) to achieve their objectives.

Not only is information going digital, the very existence of such information has taken the global village (McLuhan & Powers, 1989) from an idea to reality. Globalisation is being driven by national and international deregulation, and by the IT related communications revolution (Houghton, 2002). With advances in technological development, information can be shared quicker and further to different regions of the world leading to the idea of a "ubiquitous society". A ubiquitous society is a society in which people can access a network anytime, anywhere and for anything (Tomonori, 2004).

The abundance of information that typifies the current century is insufficient to contribute to what is called a knowledge society. On the one hand the lack of structure to the Internet is a problem. Boyer (1997) for example, stated that for information to become knowledge, it must be organized. And in 1977 the Internet was vastly smaller than it is today but no better organized. Laverty (1997) noted that the lack of organization is compounded by the inadequacy of searching tools and the likelihood that search engines will be unable to sift 'good' from 'bad' information. Despite continued sophistication of search engines and other tools the challenge continues. The question is: do information seekers have the capacity to determine what is valid, authentic and reliable on the Internet. The World Summit on the Information Society in 2003 went further when it claimed that: "Each person should have the opportunity to acquire the necessary skills and knowledge in order to understand, participate actively in, and benefit fully from the Information Society and the knowledge economy," (World Summit on the Information Society, 2003).

The American Library Association (ALA, 1989) has equated the challenges above as a need for an informed citizenry who are information literate:

... a person must be able to recognize when information is needed and have the ability to locate, evaluate and use effectively the information needed... Ultimately information literate people are those who have learned how to learn. They know how to learn because they know how information is organized, how to find information and how to use information in such a way that others can learn from them.

Likewise the Association of College and Research Libraries (ACRL, 2000) claimed that information literacy forms the basis for lifelong learning, common to all levels of education. They place particular emphasis on the capacity of citizens to be able to deal with social and legal issues. They argue that: "An information literate individual is able to understand the economic, legal and social issues surrounding the use of information, and access and use information ethically and legally."

According to Sanford (2000), information literacy is a process of turning information into meaning, understanding, and new ideas. This definition is similar to that offered by Henri (1995) where he describes, "information literacy as mastery of the processes of becoming informed". This process requires learners to understand the rationale behind using information as well as a set of conceptual and technical skills to deal with information. Learners need to know the 'how', of a task, but more importantly, they must first know the 'why' of the task.

Bruce (1997) points to the reality that there are many perceptions about information literacy and what it actually entails. Information literacy is conceptualised as:

- using information technology for information retrieval and communication;
- finding information located in information sources;
- executing a process;
- controlling information;
- building up a personal knowledge base in a new area of interest;
- working with knowledge and personal perspectives adopted in such a way that novel insights are gained; and
- using information wisely for the benefit of others.

The fact that there are such diverse perceptions is a pointer to the fussy nature of information literacy as a mainstream concept. It also demonstrates that this is not a discipline specific concept but is rather one fashioned through education and work practices.

What does this seeming multiplicity of understandings mean for information literacy education?

One approach that has been adopted is to develop a set of standards and indicators that can be used to demonstrate what might be reasonably expected from an information literate person. Examples of these standards are: the Seven Pillars Model for Information Literacy (SCONUL, 1999) and the Australian and New Zealand Institute for Information Literacy (ANZIIL, 2004). School oriented standards have been developed by the American Association of School Librarians (AASL, n.d.) and the Ontario School Library Association (OSLA, n.d.).

The nine information standards of AASL state that the student who:

- is information literate accesses information efficiently and effectively;
- is information literate evaluates information critically and competently;
- is information literate uses information accurately and creatively;
- is an independent learner is information literate and pursues information related to personal interests;
- is an independent learner is information literate and appreciates literature and other creative expressions of information;
- is an independent learner is information literate and strives for excellence in information seeking and knowledge generation;
- contributes positively to the learning community and to society is information literate and recognizes the importance of information to a democratic society;
- contributes positively to the learning community and to society is information literate and practices ethical behaviour in regard to information and information technology; and
- contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information.

According to Bruce (1997), the aim of teaching information literacy should be for students to develop a repertoire of various understandings of information seeking and use and to be able to apply various approaches appropriately to various tasks, contents and situations. Limberg (2005) found in her studies with secondary school students that if information seeking is about fact-finding, it would not be pertinent for a complex learning issue. Although there is no cause-effect relationship, there is a close relationship between the students experience information seeking and use and their ways of understanding the subject content (Limberg, 2005).

An information literacy framework is designed to refocus a school's attention towards how students learn and how they are able to demonstrate their learning. The research has found that to be successful self-managing learners, students will have to require comprehensive information skills in which the learning environment of the programme had already provided to its students. In particular, principals, curriculum coordinators, teacher librarians, and teachers responsible for coordinating IT across the curriculum play an important role in the culture building of information literacy in schools (Henri, Hay and Oberg, 2002) and forming the "learning to learn" infrastructure. The Base 6 curriculum integration programme at the Kuranui College, New Zealand, is an example of a student-centred inquiry model which enables the development of information skills appropriate for lifelong learning (Barlett, 2005).

1.2 Research Methodology

There were four components to the research. Firstly, a set of standards on information literacy were proposed based on a selected group of models developed internationally, and by taking the

Hong Kong environment into consideration. Secondly, a region-wide questionnaire was distributed to Hong Kong's primary and secondary schools to gain feedback from education practitioners on the proposed standards. Thirdly, focus group discussions were conducted to understand in-depth how education practitioners would feel toward the proposed standards. Fourthly, a number of public consultation sessions took place—aimed at a wider audience—to gain further input to refine the study.

2. PROPOSING INFORMATION LITERACY LITERACY STANDARDS FOR HONG KONG STUDENTS

When considering the development of an IL framework, it should be framed in such a way that students are empowered with the capability for lifelong learning. Eight selected models developed in different regions were scrutinized to gain understanding on the current IL development trends (Kong et al, 2005, November/December). The models were: SUNY; ACRL; AASL; SCONUL; AkASL, WLMA; ANZIIL; and JULM. The four key dimensions of learning, namely: cognitive; meta-cognitive; affective; and socio-cultural were employed as a way of categorizing the standards. An open coding process was employed to group the common standards under each category (Li et al, 2006, 222)

Table 1: IL standards in 4 dimensions – cognitive (C), meta-cognitive (M), affective (A) and socio-cultural (S)

Code	IL standards
C1	Able to determine the extent of and locate the information needed
C2	Able to apply information to problem-solving and decision-making
C3	Able to analyse the collected information and construct new concepts or understandings
C4	Able to critically evaluate information and integrate new concepts with prior knowledge
M1	Able to be aware that information processing it iterative, time-consuming and demands effort
M2	Able to plan and monitor the process of inquiry
M3	Able to reflect upon and regulate the process of inquiry
A1	Able to recognise that being an independent reader will contribute to personal enjoyment and lifelong learning
A2	Able to recognise that information processing skills and freedom of information access are pivotal to sustaining the development of a knowledge society
S1	Able to contribute positively to the learning community in knowledge building
S2	Able to understand and respect the ethical, legal, political and cultural contexts in which information is being used

The next stage of the study was to understand the perception of education practitioners towards the development of the IL framework and gain their support on its implementation based on the aforementioned key dimensions and their associated standards. The purpose was to adopt only those standards that are suitable for Hong Kong students across different levels of education.

3. REGION-WIDE QUESTIONNAIRE FOR PRIMARY AND SECONDARY EDUCATION PRACTITIONERS

The region-wide questionnaire survey was designed to embrace the four key dimensions of learning; the main concern of the IL framework. A total of 3,924 questionnaires were sent to all 1,308 primary and secondary schools in Hong Kong, in December 2004 to invite participation from principals, curriculum coordinators, teachers responsible for coordinating IT across the curriculum and teacher librarians of each school. The total number of completed questionnaires was 2,608. This represented

a response rate of 66.46% (Kong et al, 2005, July). The purpose of this questionnaire was to ask how education practitioners would rate the importance of the indicators of the IL framework's standards.

Table 2: Demographic data of the region-wide questionnaire survey

Category		No. of schools invited	No. of questionnaires sent	No. of questionnaires replied	Response rate (%)
Primary schools	Morning	153	459	309	67.32
	Afternoon	148	444	284	63.96
	Whole day	485	1455	996	68.45
	Total	**786**	**2,358**	**1589**	**67.39**
Secondary schools	Morning	14	42	4	9.52
	Afternoon	14	42	7	16.67
	Whole day	494	1,482	1,008	68.02
	Total	**522**	**1,566**	**1,019**	**65.07**
Total		**1,308**	**3,924**	**2,608**	**66.46**

4. FOCUS GROUP DISCUSSIONS WITH EDUCATION PRACTITIONERS FOR IN-DEPTH FEEDBACK

There were 17 discussions for focus groups that included: associations in education, education bodies; various local and international schools; and expert panels on IL. These were conducted between November 2004 and February 2005. The duration for each session was 90 minutes, involving discussions between the participants and the Task Group.

Table 3: Demographic data of focus group discussions

Focus group category	No. of focus groups	No. of participants
Associations in education	1	8
Education bodies	1	7
Secondary schools	5	22
Primary schools	4	7
IT pilot secondary schools in 1998	1	17
IT pilot primary schools in 1998	1	3
International schools	2	8
Expert panels on IL	2	30
Total	**17**	**102**

5. PUBLIC CONSULTATIONS TO PROMOTE THE PROPOSED STANDARDS AND TO GAIN FURTHER FEEDBACK FOR STUDY REFINEMENT

In February 2005, eight consultation sessions addressed an audience of primary and secondary education practitioners. Essentially, the sessions served two purposes: First, to report on the IL framework development progress by the Task Group the results obtained from the region-wide questionnaire survey and the focus group discussions. Second, the Task Force sought further input from the audience on their views for the framework development which would be used as refinement for the whole study, and hence, the support for the implementation. Over 300 education practitioners attended those open sessions.

6. RESULTS

(a) Region-wide questionnaire survey

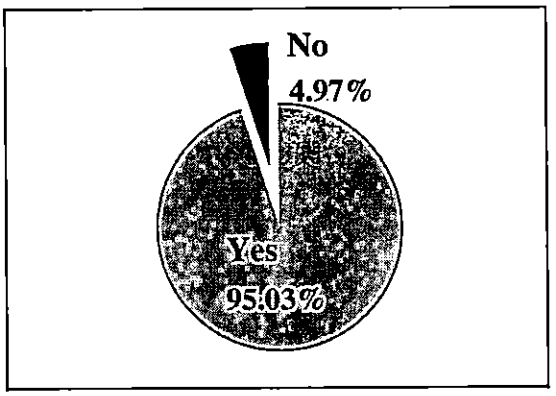


Figure 1: Results on whether IL education is needed for students

Over 95% of the respondents agreed that education for IL is required for Hong Kong students. What this highlights is that education practitioners would see that students being information literate as very important. Respondents were asked to rate the importance of *what students are expected to be able to achieve* (i.e. indicators) *when they graduate* by using a four-point scale. These indicators are the subsidiaries of standards that are proposed for the IL framework. The higher the average figure, the more importance the respondents would value students to possess that capability in information processing.

Table 4: Top 10 ratings from the region-wide questionnaire survey by primary school practitioners on the indicators applicable to primary students – cognitive (C), meta-cognitive (M), affective (A) and, socio-cultural (S)

Code	*IL indicators*	*Average (1-4)*
A	Read for information and pleasure	3.36
M	Understand the information processing requires time, diligence and practice	3.33
A	Recognise and select materials appropriate to personal abilities and interests	3.32
S	Share knowledge and information with others	3.27
S	Understand and respect for the principle of intellectual freedom	3.27
S	Collaborate effectively in groups to pursue and construct knowledge	3.25
S	Understand and respect the principles of equitable access to information	3.24
M	Recognise the information seeking process is evolutionary and changes during the course of investigation	3.22
C	Apply information in problem-solving	3.22
A	Recognise that being an independent learner will contribute to lifelong learning	3.19

Table 5: Top 10 ratings from the region-wide questionnaire survey by secondary school practitioners on the indicators applicable to secondary students – cognitive (C), meta-cognitive (M), affective (A) and, socio-cultural (S)

Code	*IL indicators*	*Average (1-4)*
A	Recognise that being an independent learner will contribute to lifelong learning	3.49
A	Recognise and select materials appropriate to personal abilities and interests	3.45
C	Apply information in problem-solving	3.45
S	Understand and respect for the principle of intellectual freedom	3.45
A	Recognise that accurate and comprehensive information is the basis for intelligent decision-making	3.44
M	Understand the information processing requires time, diligence and practice	3.44
S	Understand and respect the principles of equitable access to information	3.41
A	Read for information and pleasure	3.40
S	Observe laws, institutional policies and social etiquette related to access and use information	3.40
S	Collaborate effectively in groups to pursue and construct knowledge	3.40

Primary schools practitioners considered their students to "read for information and pleasure" as the most essential element as opposed to secondary school practitioners valuing their students to "recognize that being an independent learner will contribute to lifelong learning" on the same ranking. Although both above mentioned indicators fall within the affective dimension as the number one importance, the differences between the opinions of primary and secondary practitioners is evident in the number 10 ranking, where primary students should "recognize that being an independent learner will contribute to lifelong learning".

Secondary practitioners identified the ability to "collaborate effectively in groups to pursue and construct knowledge" as the least important indicator. This may suggest that under the current education system, schools are not designing opportunities in the classroom that emphasise teamwork and coordination among peers for their learning.

(b) Focus group discussions

On the development of the IL framework, there were six main questions asked:

- Is IL needed in Hong Kong for its future development?
- What are your opinions on respect to knowledge, use information effectively and efficiently, and disseminate information ethically?
- What elements should be included in the IL framework for HK students?
- Why should IL standards be developed?
- How to develop the IL standards?
- What abilities would you consider the students to possess by the time they graduate?

An overwhelming majority of 95% of participants agreed that IL is needed in Hong Kong. They believe that as Hong Kong grows as a knowledge-based society, sufficient IL skills are required to compete in the global high value-added industries, as:

"Information is flooding into a knowledge-based economy, so people need to know how to process information from various sources." (Participant 1)

"Have the ability to provide solutions to various problems." (Participant 2)

"IL is needed for the student to know how to learn from information rather how to memorise information." (Participant 3)

The quotes below are an indication of the way that an examination driven curriculum embedded within a Chinese culture may influence intellectual property issues:

"Teachers often feel embarrassed when quoting references or citations." (Participant 4)

"(Teachers) often value the end product and so plagiarism is indirectly encouraged." (Participant 5)

"Thinking outside the box is a better way to solve problems, to produce innovations." (Participant 6)

"Commitment and honesty are not new concepts in the Chinese society." (Participant 7)

The difference between IL and IT was raised as an issue among participants. They believe that IL is wrongly equated with IT; where the former focuses on information processing skills and the other on technological skills. This has implications for the elements that should be included in the IL framework:

"The term 'IL' may give the public a misconception that IL is specific to IT only." (Participant 8)

"IL involves using technology as a means for the information process, to develop the project learning abilities of students." (Participant 9)

"(IL) should not encourage students to duplicate information directly from sources." (Participant 10)

IL standards should be developed because most participants think that standards could tell the society on what to look for from children when they graduate from schools:

"The standards allow the society know what we are looking for in the IL of our children." (Participant 11)

"Provide informal guidelines for schools to develop their school-based curriculum." (Participant 12)

"Let teachers know how to teach IL." (Participant 13)

Most participants stated that the IL standards should be realistic and feasible for implementation. All the standards, indicators and learning outcomes should be clear and precise:

"The standards and indicators should be the same for students in different educational levels while the learning outcomes should be different." (Participant 14)

"As clear as possible so that the school teachers can follow them easily." (Participant 15)

"Should not directly duplicate the American national standards. Ethical value is more emphasized in the Chinese culture." (Participant 16)

The expected abilities of students to possess by the time they graduate differs between primary and secondary graduates:

"Students (primary) should have the ability to use multi-media for project use. For example, the ability to take photos using a digital camera and upload the photos on to the computer." (Participant 17)

"Students (secondary) should have acquired the knowledge in computer literacy... and have confidence in project learning." (Participant 18)

(c) Public consultation sessions

The audiences at the eight sessions provided invaluable suggestions towards the study during the question and answer period. Perhaps not surprisingly many of those suggestions expressed concerns about the framework's implementation.

Of the many concerns was how IL was to be assessed. Some teachers see IL as another threatening job requirement on top of existing threats such as the benchmarking tests required for teaching languages. Because IL is a concept to be infused into all subjects rather than being an entirely separate subject, teachers would feel threatened should they fail the IL assessments and could subsequently lose their jobs. There is a perception that IL in the classroom increases the workload for teachers—many already claim the existing workload is already too demanding. IL is not seen to reduce workload.

The standards, indicators and learning outcomes adopted from studies in other countries raised concerns from some of the participants as being potentially incompatible with the Hong Kong culture. In this respect the need for education about ethical information behavior was emphasized. This was raised in the context of the difference between official statements about copyright and perceived tolerance of breeches in these regulations. Others criticized the proposed learning outcomes for being too rigid to be achieved by students of different schools on the same educational levels. They advocated that the focus should be on the individual student's improvement of IL rather than a comparison of IL abilities between students.

Other concerns raised by participants include the need for collaboration between the EMB and the Hong Kong Examinations and Assessment Authority (HKEAA) to implement IL. This primarily focused on how to administer the assessments measuring the students' attainment of achieving IL. Suggestions for the administration include interviews between the examiner and student on discussing the student's learning process of a particular project or presentation in which they were given an open resources environment, such as the Internet and library access, to conduct a research question individually or with peers.

7. CONCLUSION

Over 95% of respondents agreed that IL education is needed for students, and this clearly indicates the importance of IL and its implications towards a more competitive society in an emerging knowledge-based economy such as Hong Kong. Although this is the case, there are diverse opinions between education practitioners over the IL framework development and its implementation into the education system.

From the region-wide questionnaire, primary and secondary school practitioners have a different opinion on the indicators' importance for their respective student groups even though according to the focus group discussions, "standards and indicators should be the same for students in different educational levels".

Though the education practitioners support the development of the IL framework by highlighting the benefits of having IL education from the focus group discussions, there were concerns raised at the consultation sessions as to how the framework should be implemented. At this stage of the study, there are still many questions left to be answered on the future of a concept that a majority would see as the way forward in education. A consensus between the stakeholders is still required before IL becomes a full teaching philosophy that will become part of Hong Kong's education system for the many years to come.

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THE MODELS

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4] ANZIIL(Australian and New Zealand Institute of Information Literacy:

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6] JULM (Juarez University Libraries): http://bivir.uacj.mx/bibliotecas

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Information Literacy: An Indispensable Learning Process for Managing Knowledge and Info-Bulimia in the Emerging Knowledge Economies

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Abstract: The paper emphasizes the need to promote the concept and practice of information literacy across frontiers to enable the stakeholders to manage knowledge and info-bulimia in the emerging knowledge economies. After stating the fact that information literacy is a basic human right for self-actualization and sustainable socio-economic development, efforts have been made in this paper to underline the point that value of information, knowledge and wisdom (IKW) lies in their use. In fact, information literacy is an essential condition for creating, managing and using the IKW strategically. The information search process is emphasized in this paper and the nature and types of knowledge and learning have also been discussed. The recommendations of the National Knowledge Commission; the mandate of UNESCO's Education for All Programme (EFAP), and Information for All Programme (IFAP) have also been discussed the context of information literacy. Finally, it has been suggested that information literacy initiatives must be fine tuned according to the complexity and diversity of information communities to empower the human resource.

Keywords: Information Literacy, Lifelong Learning, Knowledge Management, Info-bulimia, Digital Divide, Digital Inclusion, Empowering-8 Model, and National Knowledge Commission.

1. INTRODUCTION

Preservation and access to knowledge and information are twin towers of the library and information profession. There is a symbiosis between preservation and access. Based on this symbiosis and philosophy, library and information professionals (LIPs) have adopted various approaches to promote the use of knowledge and information. We started with library instruction and have reached information literacy via bibliographic instruction, bibliographic instruction and user education. Information literacy (IL) has been adopted since 1974 when Zurkowsky used this term for the first time. This concept has gained ground these days because today library is not the only source of information. Information can be accessible from various sites of information. In fact, with the emergence of the Information and Communication Technologies (ICTs), the Internet, and the Web, information has become transcendental and fluid. The traditional constraints of space and time are no more there to deny access to information to the end-user. The end-user is able access pertinent information from anywhere at anytime provide that information is available, affordable and accessible. IL facilitates bibliographical, physical, lingual and intellectual access to information. Unfortunately, the spectrum of information literacy is rich in rhetoric but poor in practice in diverse contexts in the developing countries. In the Western idiom, information literacy has been defined as stake holder's ability to ascertain his information needs, and then to access, evaluate and use that information for problem-solving and decision-making efficiently and effectively. But this definition provides a very limited view of information literacy. We must learn to think out of the box and keep our third eye focused on the cultural context. We should always remember that libraries, web, and educational institutions are not the only sites for information, knowledge and learning. Information comes from graphic records, physical structures, and social-cultural contexts as well. Hence, the concept, process and practice of information literacy

must be perceived holistically in view of the diversity and complexity of formal and informal settings at home and work. Exploration, analysis and sense-making of information ecology and socio-cultural diversity are essential components of the information literacy process. With the ascent of digitization, databases, and networks; information has become fluid and transcendental, and is available in variety of formats. Hence our perception of information literacy must be based upon media, computer and network illiteracies as well. Engagement, empowerment, enrichment, enlightenment and embodiment are the essential attributes of the info-literate stakeholders. Different people may have different viewpoints of information literacy, but it is a hard fact that only info-literates can stay ahead of time, in this era of discontinuous change and fierce competition, by developing and using information literacy skills to support lifelong learning and knowledge management. This learning must include: learning to know, learning to do, learning to work together, and learning to be better than the best. Similar views have been put forward by the UNESCO report entitled *Learning: The Treasure Within.* In the context of the emerging knowledge economies, the most important thing is learning to be a face in the crowd and to be where you want to be. IL has the capacity to facilitate this self-actualization and socio-economic development across frontiers.

The general perception that 'one size fits all' is not valid in the case of information literacy. It is true that information literacy is a tool for lifelong learning and knowledge management, but we must always remember that all human beings are not equally intelligent. Hence, we must learn to take cognizance of individual information gaps and learning disabilities. The cultural context of learners also plays a pivotal role in this regard. Dorner and Gorman (2006) and Hofstede (2001) have dealt with the cultural contextuality at length. The core cultural assumptions provide lasting bond strength to the norms, values, and visible behaviour on the one hand, and thinking, learning, working, and communication styles on the other. The core assumptions of cultures do not change easily. Therefore, proper care must be given to the cultural context before designing, delivering, and evaluation the information literacy programmes. Socio-economic inequalities, self-concept of stakeholders, gender status, attitude towards information gap, and core assumptions of given cultures are critical components to be considered with regard to information literacy. These considerations are really critical for the nations with composite cultures.

2. HALLMARK OF INFORMATION LITERACY

The basic purpose of information literacy is to develop sense-making ability among the stakeholders. Once the information seeker becomes aware of the information gap and its critical consequences, he would try to define his information need. Task, time, interest, and information are the other parameters which influence end-user's information behavior. The end-result of the whole exercise is independent learning and critical thinking. An information literate person will be a competent person to develop focus, find right answers, and build personal perspective. He would be able to convert knowledge into information and information into knowledge on continuing basis. Information literacy must facilitate sense-making and reduction of vast quantities of information into fundamental patterns into a given context. That is in fact hallmark of IL in knowledge management. Sustainable knowledge, in fact, is the end result of data analysis and information processing in a given context. In other words, there is symbiosis between knowledge and information. Information eliminates uncertainty and knowledge leads to confidence. Therefore, it is true that less is more and more is less. Valid knowledge, though less, is always better than overwhelming amount of unprocessed data and information. Information literacy ensures confidence and sense-making among confused and uncertain information-seekers. But the

conflicting information always increases the existing uncertainty among the stakeholders. Information overload and ICT instability further lead to info-stress and techno-stress among the information-seekers. Information literacy provides elbow support during these stressful moments. Kuhlthau (2005) has done good work on information literacy as a process of seeking meaning. People interested in developing bottom-up information storage and retrieval systems must read this book. Only reading of such books can facilitate intellectual access and success.

3. STANDARDS, MODELS AND RUBRICS

Twenty nine indicators under nine standards within three categories of information literacy, independent learning, and social responsibility have been prepared by the American Association of School Librarians and the Association for Educational Communications and Technology. These are available as chapter two of the book entitled *Information Power: Building Partnership for learning (1998).* Eisenberg, Lowe and Spitzer (2004) have given very useful information on various standards, models and rubrics of information literacy. But because of the constraints of space and time, it is not possible to discuss these in this paper. The most important thing is to avoid intellectual imperialism. Information literacy must be seen in the context of a given culture. No single definition of information literacy will ever be acceptable to all the stakeholders. It is indeed incumbent upon the information seekers to take a holistic view of the affective, cognitive and physical dimensions of information search process. At affective level, the information seeker experiences feelings of uncertainty, enthusiasm, frustration, confusion, disappointment, clarity, confidence, and satisfaction depending upon the success or failure of the information search process. At cognitive level, thoughts can be vague or focused leading to increase or decrease of interest. At action level, task will start with definition of information need and end with review of the outcome of the search process. This search experience will serve as feedback for the next round of learning.

4. INFO-BULIMIA AND LEVEL OF MEDIATION

Uniqueness in the context of information search process means new information, and redundancy means what is already known to the stakeholder. Information search process definitely influences the behaviour of the information seeker in terms of his feelings, thoughts, and physical actions. Library and information professionals (LIPs) must take cognizance of these behavioural changes and intervene at appropriate stage. Kuhlthau (2004) describes five levels of intervention with regard to reference and instruction services. The five levels of mediation in case of reference service are that of organizer, locator, identifier, advisor, and counselor. The five levels of education in context of instructional services are that of organizer, lecturer, instructor, tutor, and counselor. Leaving aside the explanation of these five levels of intervention in two different contexts, the message is that LIPs must be able to identify the appropriate level of intervention to facilitate the information seeker. According to Kuhlthau, intervention outside the appropriate zone can be intrusive and overwhelming, and on both sides can be inefficient and unnecessary for the stakeholders.

5. EMPOWERING – 8 MODEL

There are many models of information literacy, but the Empowering-8 Model has been developed at an IFLA-ALP sponsored Information Literacy Workshop hosted by National Institute of Library and Information Sciences (NILIS), University of Colombo in 2004 specifically for the stakeholders

in the Asia-Pacific Region. Reference has specifically been made to this model because it has not been reported and discussed comprehensively in the professional literature. Prof. Russell Bowden, in his keynote address published in the Proceedings of the *Information Skills for Learning: Part II "Empowering-8" International Workshop (2005) (Sponsored by IFLA-ALP, UNESCO-IFAP)* has beautifully described the eight steps of this model in the following words:

1. Identify – subject, audience, key words & plan strategy;
2. Explore – resources required, information available;
3. Select – relevant information; stages of work, appropriate citations;
4. Organize – information earlier selected, between fact, fiction & opinion;
5. Create – information in your own words, revise & edit & create bibliography;
6. Present – share information with appropriate audience; display in appropriate format;
7. Assess – feedback; self-assessment and assessment with teacher;
8. Apply – review feedback and apply to next learning activity.

An information literate person must learn to know, to do, to be and to work together. He should be able to make sense, ensure quality, learn independently, think critically, and use information ethically and strategically.

6. LEARNING AND UNDERSTANDING

In view of fierce competition and discontinuous change, we will have to look beyond formal education and information management. Lifelong learning is the only way to stay ahead of change and competition. Most important thing today is **to be** a face in the crowd. Only lifelong learning can facilitate this. Learning is a lifelong process for knowing, understanding, being, working together, decision-making, and problem-solving. Information literacy is a critical link between knowledge management and lifelong learning. Hence, it is incumbent upon the learning organizations to promote learning at all levels. Senge (1994) has beautifully explained the categories of adaptive learning and generative learning. Senge has emphasized upon the role of systems thinking, personal mastery, mental models, shared vision, and team learning in the context of learning organizations. Information literacy can go a long way to facilitate both types of learning among individuals and organizations. Learning must start from the centre, with learner's interacting with local sources and then expanding his access to information sources across the globe. Collaboration, leadership, and synergy with the techniques of technology (ICT) are critical for learning to learn, unlearn, and re-learn for staying ahead of time and competition.

7. NATURE OF KNOWLEDGE AND INFORMATION

Knowledge is power but information is instant power. Timely access can lead to success.

But the nature of knowledge is highly complex. It is a fluid mix of experience, values, beliefs, expert insight, and contextualized information. Beyond formal degrees, knowledge management is the main challenge. That is true not only for the corporate sector, but for the public domain also. Aristotle's three-fold classification of disciplines as theoretical, productive, and practical is echoed in the three categories of knowledge today. These three categories are explicit knowledge (recorded information), tacit knowledge, and embedded knowledge. Managing the tacit knowledge (TK) is the most difficult

thing to do as TK resides in the memory of people. It is really critical to capture the tacit knowledge for the progress of society. Generally knowledge workers are not ready to share their tacit knowledge for fear of idea thieves or lack of motivation. But if we fail to capture tacit knowledge, it gets lost with stakeholders departure, resignation, retirement or death. The chapters on nature of knowledge, intellectual capital, and communities of practice by Al-Hawamdeh (2003) are worth reading for improving one's conceptual access to the nature of knowledge and learning. Basically, knowledge is cumulative, multi-dimensional, and dynamic. According to Nonaka and Takeuchi (1995), externalization, internalization, combination, and socialization are the basic modes for knowledge management. Therefore, the dynamic symbiosis of information literacy, lifelong learning, and knowledge management is an essential condition for the learning individuals and organizations. There must be a transition from TQM to Tacit Knowledge Management (TKM). Unlike explicit knowledge, TKM is highly complex and dynamic. It can be managed only in a very subtle manner with the help of IL and lifelong learning.

8. NKC AND DIGITAL INCLUSION

The National Knowledge Commission (NKC) is focusing on inclusion, expansion and excellence in education and access to knowledge and information. The NKC's envisioned knowledge society in India can be developed only by providing massive low-cost instant access to quality information. This society must be based upon the philosophy of digital inclusion to bridge the widening digital divide in India. Information seekers must be trained in the use of information and communication technologies (ICT) to enable them to convert information into knowledge and vive versa. Only critical thinkers and independent learners can make sense of information to create new knowledge and then use it strategically for innovation, decision-making and problem solving. "Simply speaking, the value of information lies in its use for decision-making and problem-solving. To implement the philosophy behind information commons, it is essential that the stakeholders are info-literate. They must be aware of the fact that information is a source of instant power and it can make or mar future of anyone depending upon its quality, availability or non-availability. It facilitates decision-making and eliminates uncertainty. The quality of our decisions depends upon the quality of information available to us. In other words, information literacy is a tool for lifelong learning and self-actualization." (Jagtar Singh, 2007). The politics of profit by the commercial domain need be contained by promoting the concept and practice of Open-Source Movement, hybrid libraries, institutional repositories, lifelong learning and knowledge management at all levels. The success of hybrid libraries is dependent upon holistic approach to information literacy. The affective, cognitive, and physical dimensions of end-users' information seeking behaviour must be taken into consideration while designing our information storage and retrieval systems. These systems must be based upon user feedback to facilitate the effective use of knowledge and information. The Government of India must be impressed upon to take the recommendations of the National Knowledge Commission to their logical conclusion by implementing them in a phased manner. Inflibnet leadership should take lead in promoting the concept and practice of information literacy throughout India. It must also extend its resources and services to academic and sectoral grassroots to support lifelong learning and knowledge management. LIPs must be kept on a par with the faculty members in pay-scales and status, and provided with capacity building opportunities to attract and retain talent. Simply speaking, we cannot imagine the successful implementation of resource-based leaning with frustrated and dated LIPs.

9. ESSENCE OF INFORMATION LITERACY

We must learn to take cognizance of the changes taking place around us and adopt a holistic approach to information literacy. It should start with the learner at the centre stage interacting with local sites of information and then extending his reach to the sources of information available across the globe. In other words, IL must facilitate the paradigm shift from rote learning to resource-based student-centred learning. Information literacy must include media literacy, computer literacy and network literacy. Use of the IKW for progress should be the heart of the matter. The info-literate persons must be able to attach meaning to their feelings, thoughts and actions. Information literacy standards, models and rubrics must be culture specific. Learners and mediators should also be careful about the zones of intervention. Internal and external factors affecting learning and information literacy programmes must be taken into consideration before passing on value judgments and initiating innovations. Strategic and ethical use of IKW must be facilitated by the concept and practice of information literacy. In the formal settings, information literacy initiatives should become essential components to facilitate lifelong learning and complete understanding of the domain-specific issues. But information literacy must be used to contain the twin perils of "digital divide" and "digital determinism" to bridge the "information literacy divide". UNESCO is celebrating the United Nations Literacy Decade ' (2003-12) as well as promoting the "Education for All Programme (EFAP)" and the "Information for All Programme (IFAP)". Independent learners and critical thinkers are the expected outcomes of information literacy. But the success of IFAP is dependent upon the success of EFAP. Hence, information literacy programmes must be based on the complexity and diversities of learning communities; and must lead the stakeholders from uncertainty to action through thorough understanding of the information dynamics.

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Information Literacy and Knowledge Management: A 21st Century Strategic Partnership

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Abstract: Two highly complementary library and information science (LIS) concepts are inextricably intertwined and should be pursued simultaneously as we enter the 21st Century. The one concept is Knowledge Management (KM); the other is Information Literacy (IL). This brief paper endeavors to define and examine each concept in terms of its application to problem-solving and decision-making in institutions and organizations, explains how the two concepts inter-relate and are inter-dependent, and how they should be optimally harnessed together by all institutions and organizations. Also, the paper lists some lessons learned historically by both theoreticians and practitioners of each concept. The style of the paper is quite informal and is primarily based on the research and on-the-job experiences of the author who has written over 400 articles and 40 books that have been published in international journals, newspapers, magazines, and discussed in television interviews and in documentaries. Therefore, the assertions, conclusions and recommendations are primarily predicated on personal experiences rather than upon a scientific survey of practices.

Keywords: Information Literacy, Information Management, Data Management, Knowledge Management, Management Information Systems, Expert Systems, Knowledge-based Systems, Information Fluency, Information Competency, Information Systems, Information Services, School Libraries, Multi-media Centres.

1. INTRODUCTION

1.1 Conceptual Precursors of Knowledge Management

Knowledge Management (KM) is the formal name being given to a concept that has a long history of precursor ideas. The term is simply the latest one in a progressive, evolutionary series of very closely related concepts that have been invented, designed, developed, experimented with and practiced since World War II. It reflects the various conceptual and in-practice relationships between two different disciplines - - Management Science and Library and Information Science. It focuses on how those twin concepts can be melded together and then applied to problem-solving and decision-making in all kinds of institutions and organizations, and at all levels - - from the highest spheres of international organizations right down to the lowest organizational units, in both the private and public sectors. In short, KM did not "spring anew from the ground like a new species of plant or animal," so to speak. Instead, it was preceded by a logical progression of concepts over a span of perhaps 60 years each of which laid another foundational building block to the structure that has now become modern KM.

Let's briefly examine some of those key foundational building blocks.

1.2 Indexing, Classification Systems and Data Management

One classic KM conceptual precursor is called 'indexing' and another is called 'classification systems.' They were invented by library scientists hundreds, if not thousands of years ago, to help classify, organize, manage, access, search for, retrieve and control ever-increasing volumes of document flows and holdings, primarily within the institutional library and publisher contexts, including museums, archives and documentation centres. Another was called 'data management' or DM and it reflected the interest of theoreticians in applying modern management methods and techniques to

information content arising from scientific and technical observation and measurements, such as those obtained in laboratory experiments.

1.3 Information Analysis, Information Dissemination Centres, and Clearinghouses

Soon after, we saw the evolution of data management centres, information dissemination centres and information analysis centres. Those entities were yet another example of the deeper and wider, early expansion and extension of the basic KM idea, but oriented to various specialized functions and subject matter areas to help documentalists, patrons, researchers and other kinds of information users search for, retrieve, find, and use the documents and information, and other materials they needed such as audio and video holdings, they needed for research or technological development. As the functions contemplated for these centres expanded and became more specialized, both vertically and horizontally, the notion of a 'Clearinghouse' evolved, and today that term is still fairly commonly used to refer to a collection of all kinds of 'information containers' that are pertinent to a given subject (e.g. health, energy, the environment, etc.). All of these post World War II developments took place in the 1950 – 1970 timeframe, and it was no accident that at the same time computers and related computer and information science and technology (we now call "ICT") developments took place, providing powerful information and communication assisted tools that librarians and information scientists could utilize in their work.

1.4 Management Information Systems (MIS)

In the 1960s the concept of Management Information Systems (MIS) evolved and was at that time the newest attempt to correlate the inter-relationships between Management Science and Information Science. Theoreticians contended that in addition to scientific and technical information systems (STI), and conventional business information systems (inventory control, personnel, accounting, budgeting, and so on), there should be yet another family of information systems placed side-by-side with the others, and it should be expressly designed for middle and upper levels of management - - not for professional and technical personnel.

1.5 Information Management

Then, in the 1970's, the concept of Information Management was evolved, bringing with it the goal of trying to provide a tool to management to help them assess how information flows and holdings, both intra-organizational flows and extra-organizational flows - - from and to external producers and consumers, could be harnessed and made more directly responsible to the needs of the organization. As investments in data and information assets and resources began to grow exponentially, in both volume and cost, management began to realize that they were being forced to apply benefit:cost yardsticks to their document and information flows and holdings. No longer could it be assumed that all documents, books, serials, etc., were necessarily of equal high value, and as newer information assets began to be produced and used, management realized they had to make trade-offs, and abandon less valuable information assets in favor of the more valuable ones. Thus Information Management was born, and enjoyed wide and deep attention through the 1970s and into the 1980s.

1.6 Expert Systems and Knowledge-Based Systems

Beginning in the late 1980s yet another concept in this logical progression of key KM precursor concepts began to emerge - - Expert Systems and Knowledge-Based Systems. They reflected a desire to capture the "how to" knowledge possessed by key scientists, inventors, technicians, specialists, managers and professional employees of an organization that was otherwise lost when

the employee died, retired, was transferred to another unit, or hired by another organization. In short, the theoreticians advancing these two paradigms believed that it was not going to be enough to assume that all new-hires coming into an organization (whether fresh from academia or after a short stint working somewhere else) would possess the requisite minimal knowledge sets needed to perform their jobs efficiently and effectively. Rather, they contended, it would be necessary in modern organizations to capture the "how to" knowledge that key employees acquired only after working a very long time specializing in their jobs.

This "how to" knowledge, they claimed, was largely lost when the individual left the organization. Unfortunately, while the expectations were high that these paradigms would result in impressive gains to the knowledge reservoir of organizations, the challenges posed by learning exactly how to capture the knowledge in the heads of employees soon-to-be-lost were so formidable that the paradigms, with a few notable exceptions, were either abandoned or downgraded in terms of the support being accorded them. While they are still "on the books," so to speak, and while occasionally a strong advocate or disciple of these paradigms attempts to resurrect them, they have not fulfilled their expectations.

1.7 School Libraries and Multi-Media Centres

All the while these various information analysis and dissemination centres and clearinghouses were evolving in their own distinctive and unique ways, and in various organizational contexts, in the educational context a parallel development, the evolution of school libraries and multi-media centres was taking place. These were the pre-cursors of the Information Literacy concept. As teachers and librarians increasingly formed a bond and a partnership with each other, research pointed out that the learning process could be enriched and enhanced if librarians and teachers collaborated in the context of schoolwork and assignments given to students. Since audio and visual information media were proliferating at the same time, sometimes these units within a school and university context were called "multi-media centres" to emphasize the increasing availability of information not just in text and written forms, but also in visual and audio formats and mediums. Information Literacy and Media Literacy thus were born and became firmly rooted in the teaching and learning processes in the educational context.

1.8 Modern Knowledge Management

Which brings us to modern Knowledge Management? Beginning in the 1990s the term was coined for large-scale usage, and was initially greeted by a certain amount of healthy, expected criticism and cynicism. "Here we go again with another management fad" was the outcry heard in the halls of many academia faculties. While the level of cynicism reached a high plateau, the advocates of the concept persisted and refined their initial design parameters, downscaling expectations and attempting to shape and frame desired outcomes in more concrete and realistic terms. KM suffered initially from the same misguided set of expectations that plagued Expert Systems and Knowledge-Based Systems - - the expectation that one could, if one were clever and smart enough, actually transmute "how to" wisdom and expertise into a set of decision rules and algorithms that could routinely and regularly be applied to any kind of problem or decision confronted by managements. Fortunately, calmer and wiser heads prevailed, and as the 20th Century gave way to the 21st, KM has evolved into a more pragmatic and realistic tool.

2. MODERN KNOWLEDGE MANAGEMENT

2.1 Data, Information and Knowledge Explosions

It is doubtful that the KM idea would have gained much traction had it not been for the explosion of data, information and knowledge sources, services and systems. From scientific and technological exploration, invention and experimentation have come untold quantities of data that require careful digesting, understanding, reorganization, analysis and synthesis. No matter which field or discipline one is talking about - - physics, chemistry, space exploration, global warming, the environment, etc. - - observations and measurements, aided by computers that can now process data at unbelievable speeds, and with incredible accuracy, are creating enormous quantities of data that must be handled, classified, indexed, organized, searched for, retrieved, and communicated. Much of this chore is machine-aided. But much awaits hypothesizing and experimenting with new theories. Knowledge Management is and can continue to play a key role in the laboratory - - whether on the ground, deep in the oceans, or in outer space. Data is also proliferating in the factory context as computer-assisted manufacturing and computer-assisted design tools produce an equal volume of data that needs to be analyzed and interpreted.

In the office, the information explosion is also benefiting from Knowledge Management. Information resources have become the critical, strategic asset needed by offices, both to help reduce the enormous paperwork burden that would otherwise be clogging communication channels, but also to help inform the company, government agency, foundation, and NGO decision-makers become more informed so that they can make, hopefully, more informed decisions. Information resources are the common denominator for all resources needed by all organizations - - physical and material resources, natural resources, human resources, capital and financial resources, and "bricks and mortar." It is information that allows us to interpret and understand payrolls, inventories, budgets, audit reports, accounts receivable and payable, and all of the other management instruments every organization needs to understand where it is and where it is going. In short, next to human resources, clearly information resources are the most critical and strategic asset required by nation-states, institutions, organizations and individuals no matter what sector or field they may operate in.

2.2 Internet, Google and the Search and Retrieval Engines

Surely history will record the amazing concurrence of events that brought us incredibly powerful search and retrieval engines just as the data, information and knowledge explosions were about to inundate us. Just as this information tsunami was about to engulf us, The Internet, Google and associated ICT technologies and tools came to our rescue. While they brought obvious benefits and values, they also brought new, previously unimagined burdens and costs. Whereas, for example, when we made a search of online databases in the 1980s before the advent of the Internet or Google we perhaps got a few dozen "hits," now, with these powerful new search engines, we suddenly are getting a million or more "hits," but may still not have located precisely the information we needed! Our frustration levels have accelerated in many cases, rather than been lessened.

2.3 Acceleration of Literacy Challenges in the 21st Century

As this paper is being written, a credit financial crisis is engulfing the entire world. Governments are struggling to cope with a freezing of credits wherein banks are unwilling to borrow at extremely high rates, and, even where some are able to borrow, they may be unwilling to lend because they are afraid their loans will go sour. Commentators and ordinary citizens being interviewed by the Media and appearing on television are saying that people do not understand the crisis - - why it happened, what it portends for them, what if anything they can do about it, and so on. In short, there is a financial

literacy challenge and people are confused, bewildered, and afraid and their stress levels are rising to heights never seen before.

But financial literacy is only one of the literacy challenges we all face today. Citizens are also in need of greater literacy when it comes to being informed about the energy and environmental challenges faced by almost all nations, and therefore all individuals, especially the developing and transitional countries and their citizens. Then there is the health care crisis. How do ordinary people find out the information they need about diseases and illnesses which they or their families are facing or are about to face? How do they know whom to seek counsel from, where to go, and who to see at the local community level? This is a health literacy challenge.

And then there is the job literacy challenge. The unemployed, the underemployed and migrant populations moving from one place to another all are facing the problem of trying to find employment. Many people need a second or even third job nowadays, just to make ends meet. This is a job literacy challenge.

But the list does not end there. For example, finding a school or university to attend, finding a student loan source or other form of financial aid is also a common literacy challenge faced by many many citizens. So is finding a convenient, accessible local community aid organization to help.

In short, we are besieged by all sides, offering all kinds of ideas and "solutions" to our personal and family problems. Trying to sort through all of this available information and these counter claims is an almost impossible job. And many people simply do not have physical access to (they may not have a computer or access to one), nor are they entitled to access this information because for some reason they are not authorized or entitled to it by virtue of their social class, gender, age, race, religion, or other reason.

Like the basic, classic literacies of reading, writing and numeracy, information literacy has become a critical 21st century need, and many experts believe affordable and ready access to information literacy training should be a human right listed in the U.N. Universal Declaration of Human Rights.

I said in a recent publication, "Understanding Information Literacy: A Primer" which UNESCO asked me to author:

"Over the course of your lifetime, the more you learn and thereby come to know, but especially the sooner you master and adopt proficient learning skills, habits and attitudes - - finding out how, from where, from whom and when to search for and retrieve the information that you need to know, but have not yet learned - - the more information literate you thereby become. Your competency in applying and utilizing those skills, habits and attitudes will enable you to make sounder and timelier decisions to cope with your personal and family health and welfare, educational, job-related, citizenship and other challenges."1

That is, in my view, the central challenge of our age if the planet is ever to recover from and cope with its many political, economic, social and cultural crises and challenges we're faced with today.

3. HOW DO KNOWLEDGE MANAGEMENT AND INFORMATION LITERACY TEAM TOGETHER

Finally we come to addressing the "glue" that holds and binds Knowledge Management and Information Literacy inextricably together. There are a number of links and bonds between them. Here are some approaches which the author has learned over the years.

Information Literacy teams are usually in one kind of organizational unit, and Knowledge Management teams are in another kind of unit. We are here concentrating on why and how those two teams should work more closely together.

First, Information Literacy teams and Knowledge Management teams must work closely together so that as "what" and "how to" knowledge is captured systematically, classified and indexed, put into information systems, stored, searched for and retrieved, and then used, that knowledge is organized, can be efficiently searched for and easily retrieved, and then applied to problems and decisions. It is of less than optimal value if the two teams work in isolation to one another because their plans, their programmes and their projects must be coordinated and synchronized if they are to be synergistically inter-related.

Second, each group needs to learn about the others. Each groups needs to apprise the other of their goals, their visions, their work and how they work, and so forth. This has as much to do with the processes that each employs as it does with the products that each produces. Each has a different culture, and those cultures need to be blended.

Third, top management must have its awareness level raised as to how the two groups need to work together toward common organizational goals. Information Literacy teams tend to be located in education, personnel development, training and similar units, whereas Knowledge Management groups tend to be located in systems and ICT units, which are far more tools and technology oriented, whereas Information Literacy teams tend to have a culture which is more people-centric.

Fourth, the organization's rewards and punishments systems must have concrete and specific rating factors that place a premium on the two teams working together toward common goals. Supervisors should be rating and evaluated in part upon whether they can cite specific instances and episodes wherein, by working together in a coordinated fashion, the two groups are able to accomplish an overall organizational goal and objective in a more efficient and effective manner than would otherwise be the case if each operated independently.

4. CONCLUSION

Information Literacy goals, programmes, projects and cultures should be coordinated and synchronized closely with Knowledge Management goals, programmes, projects and cultures within the same overall organizational context. To achieve maximum benefit, they must be blended together because they are synergistic, not independent concepts and approaches.

1. Top Management must be sensitized to why and how the two concepts are inter-related, and reward and punish supervisors in part on the basis of how successful they are in synchronizing the work of the two groups. In short, supervisors must be held accountable for results in coordinating the work of the two areas.
2. Knowledge must come to be regarded, next to human resources, as the most valuable of all of the organization's assets. Therefore, knowledge resources need the same careful top priority, time allocation, and supervisory attention accorded to the management of human resources.
3. Information Literacy is a goal and expected result of sound Knowledge Management theory and practice, just as Knowledge Management is a goal and expected outcome of Information Literacy theory and practice. They are, in other words, the Ying and the Yang of the same circle.

Footnote

1. Enter "Woody Horton" as a Google search term to see an online bibliography of the author's published works, including the UNESCO 2008 publication herein cited.

Information Literacy: The Stepping Stone to Knowledge Economy

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Key Words: Information Literacy, Information Skills

1. KNOWLEDGE REVOLUTION AND LIFE LONG LEARNING

The rate of knowledge creation and dissemination has increased extensively over the past 25 years mainly as a result of the rapid decrease in the costs of computing and networking due to the technological advances. This in turn has enabled more efficient dissemination of knowledge. . Cross border communications enabled through developed ICT has improved the productivity of the researchers through collaboration. As a consequence generation of new knowledge and technology has escalated which is evident from the increase in the number of patents granted to inventors.

Increased creation of knowledge has increased the efficiency of modern production techniques and this has created an intense economic competition among the countries. The share of world trade (imports and exports) has increased from 24 per cent in the 1960s to 47 per cent in 2002 (World Bank 2007). This trend offers more economic and social developments for many countries but the countries which cannot keep up with this pace of rapid change do fall behind.

As much as the advances in ICT have introduced competition to the global economy, the competition has changed the needs of the labour market. Rather than the physical abilities of the work force or the efficiency of transforming raw material into end-products the competitive global economy demand a workforce with advanced technical skills (literacy, knowledge of foreign languages, maths, science, problem solving, and analytical skills), interpersonal skills (teamwork, leadership and communication skills) and methodological skills (ability to learn on one's own and to cope up with risk and change) (World Bank 2003).

These skills are specifically needed by the contemporary workforce because the current knowledge has a shorter life span due to rapid advances in the generation of new knowledge. Skills depreciate fast and the need to upgrade the skills as soon as possible arises.

This indubitably proves us that the survival of any country in the competitive global economy will depend upon the extent to which new knowledge is created and used in its development process. If the knowledge-based capabilities are low the intensity of development will be low but if the knowledge-based capabilities are high the intensity of development will be high.

With the sustained use and creation of knowledge is at the center of the development process an economy essentially becomes a *Knowledge Economy*. A Knowledge Economy is one that utilizes knowledge as the key engine of economic growth. It is an economy where knowledge is acquired, created, disseminated and used effectively to enhance economic development but it does not necessarily revolve around high technology or information technology (World Bank 2007). Table 1 depicts the rankings of some of the Central and South Asian countries as knowledge economies.

Table 1 – Knowledge Economy rankings of Central and South Asia

Rank in the global context	Country	KEI	Economic Incentive Regime	Innovations	Education	ICT
71	Kazakhstan	4.74	4.82	3.75	7.22	3.18
81	Sri Lanka	4.07	4.44	4.44	5.02	2.37
87	Kyrgyz Rep.	3.65	3.25	2.67	5.92	2.76
99	Uzbekistan	3.06	1.03	3.51	5.74	1.96
100	India	3.04	3.67	3.95	2.11	2.45
109	Tajikistan	2.36	2.37	2.31	4.01	0.75
115	Pakistan	2.04	2.43	2.73	1.01	2.01
125	Nepal	1.49	2.06	2.04	1.41	0.46
127	Bangladesh	1.33	1.10	1.68	1.45	1.08

Source: World Bank (2007)

Becoming a successful knowledge society depends upon several key elements; long tem investments in education, developing research capabilities, modernizing information infrastructure and having a healthy socio-economic environment. These are considered as the four pillars on which the knowledge economy is built.

Providing citizens with the new skills needed for the knowledge economy require a new paradigm of education. Rapidity of change means that the skills already acquired, depreciate fast than before. To stay abreast workers need to upgrade their skills continuously. A 12 to 15 year school and university education cannot provide all the necessary skills. Instead the new paradigm required is *Lifelong learning*. Schools and universities have to provide not the job specific skills but the Lifelong learning skills. The learners have to be taught how to make sound decisions, how to solve problems effectively and to learn on their own. The traditional education paradigm is not in a position to provide such skills in the teacher centered classroom. Table 2 portrays the different characteristics of the traditional and Lifelong learning paradigms.

Table 2 - Characteristics of traditional and Lifelong Learning paradigms

Traditional learning	*Lifelong learning*
The teacher is the source of knowledge	Educators are guides to sources of knowledge
Learners receive knowledge from the teacher	People learn by doing
Learners work by themselves	People learn in groups and from each other
Tests are given to prevent progress until students have completely mastered a set of skills and to ration access to further learning	Assessment is used to guide learning strategies and identify pathways for future learning.
All learners do the same thing	Educators develop individualized learning plans.
Teachers receive initial training plus ad hoc in-service training	Educators are lifelong learners. Initial training and ongoing professional development are linked.
"Good" learners are identified and permitted to continue their education	People have access to learning opportunities over a lifetime.

Source: World Bank (2003: p. 29)

2. SYMBIOSIS OF LIFELONG LEARNING AND INFORMATION LITERACY

Lifelong learners need to foster special skills to continue learning throughout their lives and these skills need to be fostered by creating a suitable learning environment. This proper learning environment which fosters lifelong learning skills is known as the "Information Literacy".

Literacy usually denotes the ability to read and write. UNESCO (1986) moves a step further and states that a person possesses "functional literacy" if he can use reading, writing and calculation for his own as well as his community's development. Nevertheless, reading, writing and calculating is not sufficient to thrive in the modern super complex society because there are many other formats in which knowledge is presented. Literacy of these new knowledge formats has become crucial.

The ability to understand, use and express using images is the Visual Literacy. The ability to access, analyse and produce knowledge in television, motion picture, radio, newspapers and magazines is the Media Literacy. The ability to create and manipulate data via software tools is the Computer Literacy and the ability to locate, access and use information in a networked environment like World Wide Web is the Network Literacy. (Spitzer, Eisenberg and Lowe 1998). Each of these literacies operates in isolation of each other and each has its own vocabulary and conventions for studying, but "Information Literacy" encompasses all these other literacies.

Information Literacy has over 100 definitions but all these definitions stress several key elements in information literacy an individual's ability to; recognize a need for information; identification and location of appropriate information sources; gaining effective access to the information contained in those sources; evaluating the quality of information obtained; organizing the information to create an end-product.

3. MODELS OF INFORMATION LITERACY

It was mentioned earlier that the research process through which problem solving and self directed learning skills are fostered is known as "Information Literacy". This research process is not inherent but needs to be cultivated in a methodical way. For this purpose there are several research process models also known as Information Literacy models developed by educators that describe the steps and outline the path an information literate person follows when searching for information.

Quite a wide range of models exists within and across the countries. i.e. 8Ws, Follett's Pathways to Knowledge, Big6, Information Seeking, Information Process, Information Skills, Research Process, Info Zone and Research Cycle models. Space allocated to this paper does not warrant a detailed discussion, but Lamb (2001) provides a good comparative study of all these models. The significant fact to note is that there is no perfect model and across the models there are more similarities than differences. Basically all models consists of six steps related to information; appreciation and enjoyment, background building, seeking, understanding and appraising, organizing and using, communicating, evaluating the process and product and formulating new questions.

Selection of one model over the other depends entirely on local requirements and decisions. The vital factor to remember is that a suitable model is necessary to teach the research process.

In the South Asian region Information Literacy as a concept may be rather new, though a variety of information related skills are introduced by the librarians to their patrons. In November 2004 an international workshop was organized by the National Institute of Library and Information Sciences (NILIS), University of Colombo in collaboration with IFLA/ALP on developing information skills for learning. Empowering 8™ the Asian problem solving model was the outcome of this workshop.

(Wijetunge and Alahakoon 2005). A follow up workshop was held in Patiala, India in October 2005 again in collaboration with IFLA/ALP and UNESCO. A number of applications of Empowering 8™ were reported from Bangladesh, Nepal, Singapore, Sri Lanka and Thailand at this follow up workshop (Singh 2005).

4. EMPOWERING 8: THE ASIAN MODEL OF INFORMATION LITERACY

Empowering 8™ is now registered as an intellectual property of NILIS and being promoted in Library & Information Science programmes offered by NILIS and in a variety of other educational contexts of Sri Lanka. Though it is registered as a property of NILIS it does not restrict anyone from using Empowering 8™ for non profit making educational purposes. NILIS However expects that such users will share the applications with us so that we can enrich our knowledge.

Empowering 8™ is a model which can be used to solve any information problem effectively using eight stages with several sub stages under each component. It's not necessary to complete these stages in a linear order, but one can enter the cycle from any point and proceed in a cyclical manner. However one is taken through all stages in a successful information problem solving situation. Two arrowed lines denote the teacher and the teacher librarian getting involved in the process.

Following figure depicts the eight components of the model.

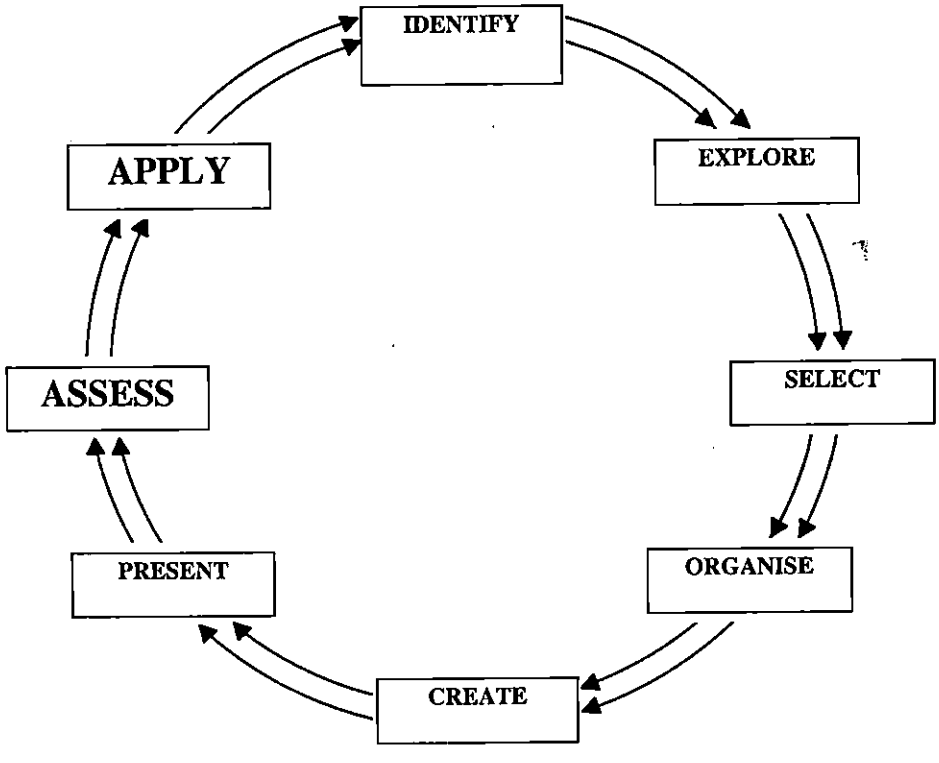


Figure 1 – Eight components of Empowering 8™

Empowering 8™ has a set of nearly 100 corresponding skills ranging from defining the need for information to application of new concepts learned to other situation. This list of skills is being reviewed still depending upon the experiences gained. Developing competencies in these skills will take place according to the nature and complexity of the problem being solved using Empowering 8™

Empowering 8™ is best understood and practiced when integrated with the curriculum activities therefore a training module was developed for the postgraduate diploma students integrating the eight components of Empowering 8™ and related skills with an assignment topic relevant to the postgraduate programme. Further details of this module can be found in Wijetunge (2008).

5. ESSENTIAL COLLABORATIVE EFFORTS

Implementing an effective Information Literacy programme within the education environment depends upon a number of collaborative efforts. From the beginning NILIS was able to function in an environment conducive for promoting information literacy.

5.1 Education policy reforms

Information Literacy skills to be truly effective, have to be integrated with the general education system of the country, not only with the formal education system (schools and universities) but also the non formal (vocational and apprenticeship training) and informal (unstructured learning which takes anywhere) education systems. NILIS was at an advantage because the National Education Commission of Sri Lanka was bringing about education policy reforms from mid 1990s. Recognizing the needs of the contemporary labour force, the concepts of lifelong learning and student centred education instead of teacher centred learning was supported by the policy reforms.

A presidential task force was appointed to implement the policy recommendations in 1996, and 1997 were declared as the "Year of Education Reforms". In order to implement the policy recommendations the World Bank provided credit for two major projects; General Education Project (GEP) first and second phases and the Teacher Education and Teacher Deployment (TETD) Project. Second phase of the GEP (GEP2) started in 1997 is significant for information literacy because in addition to eight other components it included a library development component. The objective of this component was to develop the school library sector to underpin the student centred lifelong learning paradigm.

5.2 Infrastructure developments

Under the Libraries Component of GEP2, School Library Development Unit (SLDU) was established under the Ministry of Education to take leadership in school library development activities. Many resources (Library building, books, furniture, AV equipment and Internet facilities to some schools) were provided for 4000 government school libraries (which is about 45 per cent of the total number of government schools) to develop them as Learning Resource Centres equipped not only with books but also with other audio visual material and computers. It was intended that the Sri Lankan government will expand the development initiatives to the rest of the public schools following the World Bank project.

Since there was a severe shortage of trained library professionals, the Ministry of Education decided to recruit 4000 graduates and train them as teacher librarians. World Bank funded the establishment of NILIS affiliated to University of Colombo in 1999 with the primary objective of training these teacher librarians and other types of personnel for the school library sector.

5.3 Raising Awareness

During the life-span of GEP2 many initiatives were taken to raise the awareness in the new concepts like resource based learning, lifelong learning and information literacy. In 2003 a consultant from New Zealand was invited by NILIS to train a small group of resources persons in Information Literacy. NILIS in collaboration with the SLDU conducted a series of five-day training workshops for teacher librarians across the country. Not only the teacher librarian but also a series of three-day workshops were conducted for the 4000 principles of those schools. In both instances manuals and documentation were prepared in such a way to promote information literacy. The international workshop during which the Empowering model was formulated also was supported partly by the GEP2 with the provision of the services of an information literacy expert from Canada. The proceedings and the logo of Empowering 8 were launched in May 2005, at Ministry of Education, with the participation of the Secretary to the MOE, so that the key stakeholders from the MOE will be informed of information literacy. All these activities were supported financially by World Bank project and the co-operation of the officials of the Ministry of Education made the task of promoting information literacy by NILIS much easier.

However it does not imply that it is a smooth sailing. Many issues which slow down the integration of information literacy with the school education system still persist. Although the appropriate policy reforms were made with corresponding library development, the most difficult part is the changing of attitudes of the stakeholders. Adopting a new teaching paradigm involves changing of work patterns followed by the teachers for several decades and the resistance to change cannot be changed by the policies or circulars. For the past 6-7 years thousands of school principals, teachers, school librarians and teacher librarians have been trained but even today there are many who believe that a change is not necessary. Such negative attitudes are not absent among many of the education administrators. The idea that the librarian's sole duty is to maintain the book collection is still prevalent among some authorities. Above all, all of these positive efforts discussed above are limited to the school education system. Expanding the information literacy initiatives to the higher education, informal and non formal education sectors have not commenced yet.

6. ROLE OF THE LIBRARY SCHOOLS

Why have two Library Schools have taken the leadership in Sri Lanka and India to promote Information Literacy? I strongly believe that Library Schools are the most appropriate bodies to take leadership in Information Literacy initiatives because in the new paradigm of education, the existence of the Library or the Learning Resources Centre and the effective use of information by the learners are key factors of successful lifelong learning.

The new pedagogical paradigm emphasises the empowerment of students and encourage them to take control of their own learning. The students become the learner and the teacher becomes the coach. The teacher centred school becomes a learner centred school.

In the teacher-centred learning environment, the Librarian was the organizer and guardian of the library; but now he/she must be the live wire in integrating Information Skills in to the curriculum, providing access to resources within as well as outside the library and educate the learners in analysing and synthesising information avoiding plagiarism. The role of the teacher has changed in to a more facilitating nature than imparting knowledge in the classroom. Teacher has only to guide the students while the librarian has to serve as a strong change agent in developing the independent learning skills

of the learners. Library schools have to play a significant role in equipping the librarian to face this challenge in three ways; enhancing the traditional role of the librarian, educate them to take over more responsibilities in curriculum development and teaching.

6.1 Enhanced traditional role

Information explosion has created far more information than one library could possibly contain and the learners are turning more and more towards external material in all subjects. Librarians are required to identify more and more curriculum specific material. Knowledge of students and the curriculum (either in the school or university) remains the foundation of a good library service regardless of the format of the information provided or the source.

Librarians will have to look more towards online and other electronic sources to meet the information needs and this new paradigm of selection and evaluation evolve with new technologies and their application to the classroom and resource center. Librarians must also become proficient in the use of the new technologies to promote them and instruct students and teachers in their use. Requirement of a plethora of resources makes sharing of resources necessary than ever before. Libraries need to advertise their holdings to the world, offering to loan materials on a cooperative basis. Libraries which participate in such arrangements must be well versed in the collection development policy of the cooperative to properly plan and select materials to complement those available through diverse co-operative networks.

The librarian must also teach the ethical use of the materials retrieved. Copyright and plagiarism become significant issues when digital copies may be effortlessly integrated into student work. The librarian is often the only person in the library with any training in these legal issues. As the responsibilities of the librarian increase, need for support staff increases. Librarian needs to supervise and evaluate the performance of technical and clerical staff and in house training of staff has to be carried out in a more planned manner. Library schools need to incorporate these changes in to their education programmes.

6.2 Collaborative curriculum responsibilities

A fundamental responsibility of the librarian is to provide the leadership and expertise necessary to ensure that the Information Literacy skills are fostered among students. With respect to the librarian as an instructional consultant, Information Power (1998) has identified four curriculum related responsibilities:

- participating in curriculum design and assessment,
- helping teachers develop instructional activities,
- providing expertise in materials and technology, and
- translating curricular needs into library media program goals and objectives

Unless the librarians are taught in their libraries schools how to resource the curricula they will never be able to

6.3 Teaching Role

The way in which the librarian interacted with his/her clientele has changed with the change of education paradigm. When the education paradigm was lecturing librarians were involved in *user education*, which involved guided tours around the library, handbooks and group talks. With the advent of online databases, OPACs and e-journals the assistance of the librarian to users took a form of

tailored navigational support. More specialised academic support in accessing and evaluating the technology based information is provided at this stage. With the education paradigm shifting towards student centred, resource-based, independent learning librarian's interaction with the users shifted to *introducing information skills.* Subject librarian's contribution to a specific orientation programme designed by the faculty on different information sources, belongs to this category.

7. CONCLUSION

In the 21st century Knowledge plays a vital role in socio economic development. It is only those who are leading in the creation and use of knowledge, are in the forefront as knowledge economies. It is evident that Central and South Asian countries still have a long way to reach the top 20 or even 50 ranks as knowledge economies. If we do not take hold of the opportunity we will lose our position in the global economy. If we are to be triumphant we must create new knowledge, use knowledge effectively and transform our workers in to knowledge workers. This transformation is possible only by shifting the education paradigm from rote method of learning to lifelong learning. The most effective tool for lifelong learning is the Information Literacy. Provision of Information Literacy skills can be best handled by the librarians but for that Library Schools have a big responsibility ion revising there curricula, training the faculty and equipping the departments to facilitate Information Literacy oriented Resource-Based Learning which will transform the students into lifelong learners.

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Meeting the Information Needs of Grassroots Leaders in Singapore

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Abstract: Grassroots leaders act as a two-way communication bridge between government agencies and the general public. The purpose of this study was to understand the information needs and seeking behaviour of grassroots leaders in Singapore. The areas explored by this study included: the information needs of grassroots leaders, perceived importance and usage of different information sources, frequency and modes of information sharing, and the adequacy and usage of grassroots-websites. A pre-tested questionnaire was used for gathering data and a total of 48 grassroots leaders from different constituencies participated in this study. It was found that, for handling public queries, a majority of the grassroots leaders often needed information about various financial assistance schemes available to needy residents, current and proposed government policies, constitutional bills and developmental schemes. For this purpose, the grassroots leaders preferred using government websites, information resources placed at community centres and newspapers. However, the senior grassroots leaders were using electronic information resources comparatively less frequently. The paper recommends certain measures for capturing and retaining invaluable knowledge, success stories, and strategies previously used by the experienced and long-serving grassroots leaders.

1. INTRODUCTION

In Singapore political system, the 'grassroots leaders', also called 'community leaders', act as a communication bridge between government and the general public. On the one hand, they create awareness among the general public about new government policies, development plans, financial assistance schemes, and other initiatives; on the other hand, they convey public opinions and feedback on different matters to the relevant government agencies. In the fast-changing social, political and economic environment, grassroots leaders are now entrusted to play more significant and dynamic roles in community engagement and development. The work environment of the grassroots leaders is also changing fast due to the emergence of new information sources and delivery channels. It is, therefore, desirable to understand the information needs and seeking behaviour of grassroots leaders, to ensure that their needs are met effectively for discharging their responsibilities.

2. ROLE OF GRASSROOTS LEADERS

The word 'grassroots' represents a group of ordinary people who make up a local site of collective social, political and economic action (Sorenson & Epps, 1996). The word also connotes sometimes romanticised visions of a widely popular, organic and spontaneous, rather than centralised, mechanical and bureaucratic, public life of co-operation and participation in collective decision-making (Kenneth, 2003). Grassroots leaders have roots in their communities and are motivated by passion for their community rather than money; and often their personalities differ from those elected officials or corporate leaders (Kellogg Foundation, 1999).

Grassroots or community service is an information intensive work, and like in many other fields, information provides crucial support to grassroots leaders in their pursuit of community service and development. According to Deacon and Golding (1991), whatever service the grassroots leaders provide to the community, information is the life blood for all their activities. The need for relevant, accurate and timely information to support decision making in a democratic society is essential, and

people in its absence will not be able to get their due rights as citizens. As leaders of the community, having quick access to reliable information on government policies as well as the ability to channel voices from the ground to the policy-makers are critical for the effective discharge of their roles (Littlefield et al. 2002). Grassroots leaders are expected to be sensitive to their constituents' grievances, expectations and views about different issues and policies, and be able to present these accurately to the government so that appropriate action could be taken (Amnon and Lee, 2005).

Grassroots organizations (GROs) by virtue of their close contact with residents in their constituencies are well-placed to act as an intermediary between the government and the general public. Information flows between the government and the people in two ways: from the government downwards to the people and from the people upwards to the government. For discharging their duties more effectively, grassroots leaders should have adequate knowledge and understanding of the community they serve, adequate awareness of the national issues, and rationale behind important government policies and actions. In situations where the subject is technical, complex or sensitive, the GROs could organize appropriate public forums for the relevant authorities to communicate directly with the constituents.

3. GRASSROOTS WORK IN SINGAPORE

Grassroots leaders in Singapore are volunteers, working with different committees established by the People's Association (PA). They are entrusted to build a cohesive, vibrant and cultured nation by organising a wide range of programmes catering to the needs and interests of people from all walks of life through mass participation in social, recreational and other community activities. Grassroots leaders play a significant role in improving the quality of life by promoting community spirit and racial harmony, creating a sense of belongings and organizing a variety of activities for the residents. Furthermore, they are instrumental in connecting the citizens and the government by clarifying government policies, explaining government's rationale behind major national policies and issues, and at the same time they provide public feedback, sentiments and frustrations to the government.

Grassroots organisations in Singapore help fulfil the community's needs in education, welfare and recreation through activities organized at the community centres, clubs and residents' committees. Singaporeans from different races, religions, languages, income levels, and age groups participate in a wide range of activities. Funds are also raised to give out bursaries and scholarships, provide assistance to needy families and help senior citizens to have a renewed lease of life with care and fitness programmes. Throughout the years, mass participation was mobilized by grassroots organizations for many national causes and campaigns, such as participation in neighborhood watch groups, raising awareness of diseases such as SARS and dengue, and to keep Singapore clean and green. The following are some of the major grassroots committees that usually function in a particular constituency:

a. ***Citizens' Consultative Committee:*** It plans grassroots activities at the constituency level, oversees community welfare programmes, and serves as a feedback channel between the people and the Government.
b. ***Community Centre/Club Management Committee:*** It helps build and manage community centre and clubs. It promotes racial harmony and social cohesion through various cultural, educational, and recreational programmes.
c. ***Residents' Committee:*** It promotes neighbourliness, racial harmony and community cohesiveness in public housing estates.

d. ***Senior Citizen's Executive Committee:*** It manages Senior Citizens' Clubs as well as organises a wide array of activities ranging from arts and culture, lifestyle pursuits, lifelong learning to sports and wellness programmes.

e. ***Women's Executive Committee:*** It offers opportunities to women from all walks of life to interact and enrich their experiences through a range of cultural and recreational activities.

f. ***Malay and Indian Activity Executive Committees:*** These committees organise cultural, educational, social, and recreational activities to promote harmony between minorities and the other communities.

g. ***People's Association Youth Movement:*** It organizes various activities to foster leadership qualities among youths and at the same time promote friendship at national and international levels.

h. ***T-Net Club:*** The T-Net Clubs organise creative learning programmes and sport activities for teenage boys and girls aged between 11 and 16.

i. ***Constituency Sports Club:*** It fosters community bonding through a wide array of sports activities and intra-district games for residents to participate and interact.

j. ***Civil Defence Executive Committee:*** It organises different activities and exercises to prepare residents for coping with emergencies.

3.1 Information Support to Grassroots Leaders

Dissemination of information to grassroots leaders from People's Association and different government agencies is done through Constituency Offices, based in different electoral divisions, via email or during committee meetings. In addition, there are opportunities, initiatives and avenues for grassroots leaders to share their knowledge and experiences with fellow leaders. Dialogue sessions are arranged for new grassroots leaders with their longer serving and more experienced counterparts as well as with People's Association's staff to share experiences, exchange information and clarify issues.

The exceptional pace of growth and advances in Internet has revolutionized the ways citizens can connect with government agencies for obtaining information or providing their feedback. The Peoples' Association, in line with the national IT directions, has established various websites for reaching grassroots leaders as well as providing them the necessary information for their effective functioning. The following are some of the websites established for this purpose:

Grassroots Connect (http://app.grassrootsconnect.org.sg/default.asp) is a dedicated portal for grassroots leaders to obtain information related to community work. Information related to government policies and initiatives is disseminated through *e-Newsletter* and *e-Repository*, while feedback is solicited through *e-Consultation*, *e-Forum* and *e-Survey*. The purpose of *OnePeople* portal (http://www.onepeople.sg/) is to promote racial harmony and provide information about inter-faith and inter-religious issues in Singapore. *CyberCC* (http://www.cybercc.sg) is an online virtual community portal, created specifically for grassroots leaders, to chat about their interests, share views with peers, and extend their social networks. *Singapore United* (http://www.singaporeunited.sg/cep/) is a portal for community engagement to share ideas and check out a host of community engagement activities. Lastly, *OnePA* website (http://one.pa.gov.sg/CRMSPortal/CRMSPortal.portal) offers a one-stop access to all People's Association's courses, activities, facilities, interest groups and memberships, besides hosting a *corporate website* providing information on various grassroots organizations and their functions.

In order to confidently face the challenges of the multi-religious and multi-ethnic society, grassroots leaders need reliable and up-to-date information to fully understand government policies and initiatives

as well as play a crucial role for strengthening racial harmony and social solidarity. There is a need to investigate if existing information sources available to grassroots leaders are adequate in meeting their information needs. The purpose of this study was to investigate information needs of the grassroots leaders, their perceived importance and usage of different information sources, preferred information formats, frequency and modes of information sharing, and adequacy and usage of different grassroots websites.

4. METHOD

A pre-tested questionnaire was used for collecting data for this study. Before the design of the questionnaire, five grassroots leaders from different constituencies were informally interviewed to understand their basic work environment and responsibilities. These participants were selected because of their experience and enthusiasm to share their knowledge about the community work. The questionnaire consisted of 17 questions in total and a majority of them were close-ended questions with multiple choices. An open-ended option "others" was available for some close-ended questions to enable the respondents to provide additional information not covered in the choices. The first section of the questionnaire collected demographic information about the respondents. The second section was on the information needs, information seeking behaviour, and preferred information sources and formats. Information sharing practices of the respondents were also explored in this section. The last section of the questionnaire focused on the availability of online information services to the grassroots leaders and their most preferred and frequently used websites.

The target population of the study was 70 grassroots leaders from Queenstown and Bukit Batok constituencies serving in Citizens' Consultative Committees, Community Centre/Club Management Committees and Residents' Committees. The questionnaires were distributed to the grassroots leaders through their Constituency Offices during monthly meetings of the respective committees. Forty-eight filled-in questionnaires were returned and the overall response rate was 68.6%. The survey was conducted in the last quarter of 2007.

5. FINDINGS

5.1 Profile of the Respondents

Out of the 48 grassroots leaders who participated in this survey, 31 (64.6%) were males and 17 (35.4%) were females. About one-quarter of the respondents were less than 34 years old, nearly 41% were in the age group of 35-54 years, and around 34% were older than 54. Slightly less than 40% of the respondents had attained A-levels or lesser qualifications, one-third had an undergraduate Diploma, and 27% had a degree or higher qualifications.

A majority of the respondents possessed substantial grassroots experience. Fourteen (29.2%) of them had worked as grassroots leaders for more than 15 years, 9 (18.8%) for 11 to 15 years; 13 (27.1%) for 6 to 10 years, and 12 (25%) had 5 years' or less grassroots experience. The respondents were holding different positions in grassroots committees: 24 (50%) of the respondents were committee members, 9 (18.8%) were Vice Chairmen, 4 (8.3%) either were Secretaries and Assistant Secretaries, and 3 respondents (6.3%) either were Treasurers and Assistant Treasurers. In addition, one respondent was Chairman of a grassroots committee. On the whole, a majority of the respondents were matured, well-educated and experienced, and the sample consisted of grassroots leaders holding different responsibilities in grassroots committees.

5.2 Purpose of Seeking Information

The respondents were asked to indentify purposes for which it was important for them to have access to relevant information. For a majority (62.5%) of the respondents it was 'very important' to have access to information related to financial assistance schemes available to needy residents (Table 1). One possible reason for this could be the economical and social problems faced by low-income Singaporeans due to current financial crisis and rising inflation rates. Singapore government had come up with schemes to help this segment of the society and probably that was why grassroots leaders felt information about such financial assistance schemes was very important to answer public queries.

The next important purpose was answering public queries related to new government policies and initiatives. The rest purposes included liaising with government agencies for neighbourhood issues and problems, handling crises and epidemics, and organizing recreational and educational activities.

Table 1: Purpose of Seeking Information

	Purpose	*Very Important*	*Important*	*Less Important*
1	To seek financial assistance for needy residents	30 (62.5%)	12 (25.0%)	6 (12.5%)
2	To respond residents' queries on new government policies and initiatives	14 (29.2%)	25 (52.1%)	9 (18.8%)
3	To liaise with government departments for neighbourhood issues and problems.	15 (31.3%)	25 (52.1%)	8 (16.7%)
4	To handle crisis / disaster at national level (e.g. dengue, SARS, terrorist attacks)	10 (20.8%)	31 (64.6%)	7 (14.6%)
5	To organise activities for residents	14 (29.2%)	31 (64.6%)	3 (6.3%)

5.3 Usage of Information

The respondents were asked to indicate their frequency of using different types of information for their grassroots work. It was found that 33 (68.7%) of the respondents were 'frequently' using information related to current affairs and people's feedback on various issues (Table 2). Another information type used frequently by 31 (64.6%) of the respondents was current and proposed government policies, bills and schemes. The other popular information types among the grassroots leaders were: information about community activities; information on cultural, religious and ethnic matters; and information on political matters.

Table 2: Usage of Different Information Types

	Information Type	Frequently	Sometimes	Seldom
1.	Current affairs and people's feedback on various issues	33 (68.7%)	7 (14.6%)	8 (16.7%)
2.	Current and proposed government policies, bills and schemes	31 (64.6%)	15 (31.3%)	2 (4.2%)
3.	Community activities calendar	25 (49.1%)	8 (16.7%)	15 (31.3%)
4.	Cultural, religious and ethnic matters	18 (37.5%)	20 (41.7%)	10 (20.9%)
5.	Political and related issues	17 (35.4%)	18 (37.5%)	13 (27.1%)
6.	Government and community agencies and their staff	14 (29.2%)	24 (50.0%)	10 (20.9%)
7.	Public, social and recreational amenities/facilities	13 (27.1%)	25 (52.1%)	10 (20.9%)

5.4 Preferred Sources for Seeking Information

The respondents were asked to indicate their preferred information sources or locations from where they obtain the needed information for their grassroots work. It was found that 36 (75%) of the respondents 'frequently' used the information resources placed at Community Centres (Table 3). This could be due to the Peoples' Association's proactive role in community development in Singapore by providing useful information as well as placing full time dedicated staffs in Community Centres to provide support and guidance to grassroots leaders in undertaking their responsibilities. Another 27 (56.2%) of the respondents sought the needed information from newspapers, probably because local newspapers provide good coverage of government policies, initiatives, and development plans. The other information sources used by the grassroots leaders were: staff of different government agencies such as town councils, Housing Development Board and police stations; grassroots websites, and fellow grassroots leaders. Comparatively less frequently used information sources included members of parliament, friends, public libraries, and family members.

Table 3: Preferred Sources and Locations for Seeking Information

	Information Type	*Frequently*	*Sometimes*	*Seldom*
1	Community Centre	36 (75.0%)	12 (25.0%)	-
2	Newspapers	27 (56.2%)	6 (12.5%)	15 (31.3%)
3	Government Agencies	25 (52.1%)	12 (25.0%)	11 (22.9%)
4	Grassroots websites	23 (47.9%)	13 (27.1%)	12 (25.0%)
5	Fellow Grassroots Members	20 (41.7%)	21 (43.8%)	7 (14.6%)
6	Member of Parliament (MP)	15 (31.3%)	7 (14.6%)	26 (54.2%)
7	Friends	11 (22.9%)	14 (29.2%)	23 (47.9%)
8	Public Library	6 (12.5%)	11 (22.9%)	31 (64.6%)
9	Family Members	5 (10.4%)	13 (27.1%)	29 (62.5%)

5.5 Preferred Information Formats

As shown in Table 4, the 'most preferred' information formats among the grassroots leaders were printed (43.8%) and online information sources (29.2%). It is understandable as most of the information disseminated by the Peoples' Association is either in the printed format or accessible through different websites developed specifically for the grassroots leaders. Most of the printed information sources are placed in Community Centres, easily accessible to grassroots leaders. Moreover, in addition to availability through grassroots websites, many types of information such as official memos, reports and letters are sent to grassroots leaders as email attachments.

Table 4: Information Formats Preferred by the Respondents

	Information format	*Most Preferred*	*Preferred*	*Least Preferred*
1	Printed materials	21 (43.8%)	24 (50%)	3 (6.3%)
2	Online sources	14 (29.2%)	26 (54.2%)	8 (16.7%)
3	Audio-visual materials (e.g video tapes, DVD)	4 (8.3%)	9 (18.8%)	35 (72.9%)
4	CD-ROMs	-	14 (29.2%)	34 (70.8%)

5.6 Information Sharing by Grassroots Leaders

The respondents were asked how frequently they shared their information and knowledge with other grassroots leaders. Only 9 (18.8%) of the respondents reported that they 'always' shared

information and their personal experiences with peers, and 24 (50%) reported sharing it 'most of the times'. Only 15 (31.3%) of the grassroots leaders said that they 'occasionally' shared their information and experiences with their colleagues. It appeared that a majority of the grassroots leaders had a positive attitude towards knowledge sharing for solving community problems. However, adequate avenues and ample opportunities for knowledge sharing need to be created to facilitate this vital activity.

The respondents were also asked about the modes of communication they preferred for information and knowledge sharing with their peers. As shown in Table 5, informal face-to-face interaction was the most preferred channel, followed by telephonic conversations and the grassroots committee meetings. It was worth noting that 37.5% of the respondents said that emails were the least preferred method for knowledge sharing. A further analysis of these respondents revealed that a majority of them were senior grassroots leaders. On the whole, it appeared that most of the grassroots leaders preferred sharing their knowledge with their peers through face-to-face interaction. It was probably because grassroots leaders often handled sensitive and opinion-based issues, needing more discussions and explanations. The face-to-face communication provides them a rich and conducive environment for the exchange of ideas and seeking clarifications. However, it was a little surprising that, Singapore being a highly Internet-connected society, a considerable number of the grassroots leaders did not prefer using this powerful communication channel for information and knowledge sharing.

Table 5: Modes of Information Sharing Among Respondents

	Mode of Sharing	*Most Preferred*	*Preferred*	*Least Preferred*
1	Face- to-face interaction (informal)	24 (50%)	20 (41.7%)	4 (8.3%)
2	Telephonic conversation (including SMS)	10 (20.8%)	33 (68.8%)	5 (10.4%)
3	Grassroots committee meetings (formal)	19 (39.6%)	14 (29.2%)	15 (31.3%)
4	Email	12 (25%)	18 (37.5%)	18 (37.5%)

5.7 Usage of Grassroots-related Websites

The last section of the questionnaire investigated the usage and adequacy of information provided through different websites established by the People's Association. Out of 48 participating grassroots leaders, 33 (68.8%) reported using these websites. Fifteen (31.2%) of the respondents said that they did not use grassroots websites. A big majority of these respondents were 'senior' grassroots leaders and the reasons given by them for not using were: preference for the printed materials (33.3%), lack of IT knowledge (27.7%), lack of Internet connectivity (27.7%), and difficulties in locating and using information from grassroots websites.

Those respondents who had been using the grassroots websites were asked about the adequacy of information available on these websites. It was found that 45.5% and 42.4% of the respondents respectively considered information provided by '*Grassroots Connect*' and "*OnePA*" websites as 'adequate' (Table 6). It was, however, worth noting that 14 (42.4%) of the respondents either considered '*CyberCC*' and '*Singapore United*' websites as 'inadequate'. It is desirable that the sponsoring organizations should critically evaluate the contents and interfaces of these websites to bring them close to the expectations of the grassroots leaders.

Table 6: Adequacy of Information Available through Grassroots Websites (N=33)

	Online Services	*Adequate*	*Somewhat adequate*	*Inadequate*
1	Grassroots Connect	15 (45.5%)	17 (51.5%)	1 (3%)
2	OnePA	14 (42.4%)	19 (57.6%)	-
3	PA's Corporate website	10 (30.3%)	21 (63.6%)	2 (6.1%)
4	OnePeople	9 (27.3%)	23 (66.7%)	1 (3%)
5	Singapore United	2 (6.1%)	17 (48.5%)	14 (42.4%)
6	CyberCC	1 (3%)	18 (51.5%)	14 (42.4%)

Table 7 shows the usage of grassroots websites by the participating grassroots leaders. Among all the websites available, *'Grassroots Connect'* was the most popular one, probably because it provided an effective two-way communication between the grassroots leaders and People's Association as well as different government agencies. The other popular websites were *OnePA*, *People's Association's Corporate* website, and *OnePeople* website. It was also observed that those websites whose contents were considered inadequate earlier (i.e. *Singapore United* and *CyberCC*) were being seldom used by the grassroots leaders.

Table 7: Usage of Grassroots Websites (N=33)

	Online Services	Frequently	Sometimes	Seldom
1	Grassroots Connect	22 (66.6%)	8 (24.2%)	3 (9.1%)
2	OnePA	16 (48.5%)	12 (36.4%)	5 (15.2%)
3	PA's Corporate website	17 (51.5%)	11 (33.3%)	5 (15.1%)
4	OnePeople	16 (48.5%)	12 (36.4%)	5 (15.2%)
5	Singapore United	4 (12.1%)	3 (9.1%)	26 (78.8%)
6	CyberCC	3 (9.1%)	6 (18.2%)	24 (72.7%)

6. CONCLUSION

There is no doubt that grassroots leaders play a crucial role in developing neighbourhood amenities, solving community problems, explaining government policies and initiatives, and communicating public feedback to government on different issues of national interest. These community leaders are in a best position to serve their neighbourhoods as they are part of the community and often well-respected for their contributions. However, they need access to up-to-date, accurate and reliable information to effectively fulfil their responsibilities. This study revealed that, although several websites have been created specifically for grassroots leaders, these websites have not been fully utilized. The host organizations of these websites need to study the possible reasons for their low utilization, including the relevance and usefulness of contents, suitability of the interface, navigational features, ease and effectiveness of knowledge discovery and other desired capabilities. The biggest group of the respondents not using online sources and websites were senior grassroots leaders. Most of them had limited IT knowledge, low Internet connectivity, and were lack of information searching skills. As Web is now becoming the most heavily used medium for the dissemination of public information in Singapore, there is a need to aggressively promote such sources as well as to improve basic IT and web searching skills of grassroots leaders.

As grassroots leaders help develop public opinions on government plans, policies and initiatives, handle public complains, and communicate public opinion to government, robust discussion and knowledge sharing is essential for the success of these activities. Long serving grassroots leaders can

share their rich experiences, success stories, and strategies previously used for grassroots-level campaigns with their grassroots peers, particularly with young and newly recruited grassroots members. Due to the tacit nature of such knowledge, either it might be difficult for senior grassroots leaders to formally document it or they lack the necessary skills required for this purpose. Probably the best way to help share this knowledge is to provide ample socialization opportunities and conductive sharing environment to grassroots leaders. Informal face-to-face meetings, storytelling, and mentoring the new members could be some of the possible ways to groom young volunteers for the smooth leadership succession.

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Role of Libraries in Teaching Information Skills: Some Impressions from India and Germany

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Abstract: The paper highlights the role of academic libraries in promoting and developing Information skills of students in modern automated and hybrid libraries and their role in developing a knowledge society. Defines Information literacy and major information literacy skills required by students. Explains Information Literacy initiatives in India particularly the role of Agricultural Universities in imparting Information Literacy courses embedded into course curriculum. Discusses the information literacy programs of German Universities and basic model of teaching Information skills by subject librarians at some German Universities . Also mentions difficulties into incorporating IL across the curriculum.

1. INTRODUCTION

Information literacy (IL) forms the basis for life long learning, and libraries plays a fundamental role in providing these skills. Information literacy has gained importance world wide over the last decade. It is being increasingly realized that for an effective functioning of the democratic world the citizens have to be information literate and they are able to take right decisions for the development of their society with the objective of transforming the world in to a knowledge society .

Information literacy is a life long learning process that starts at the younger age and proceeds until post work stage where each individual /citizen requires different kinds of information in different phases of life. At a younger stage individuals acquire knowledge through secondary and higher education. The teachers and library professionals impart information literacy competency through various academic program. Besides the formal education they acquire knowledge through several informal ways and update their existing knowledge in their field of interest. An information literate person is able to recognize and locate when information is needed and is able to use suitably to generate wealth and welfare for themselves and their living.

The subsequent politicization of the term information literacy has been broadly in connection with "life long learning" agenda. A subset of wider social, economic and cultural issues at the heart of Information society (IS) or Knowledge Society debate that allowed IL movement to take root and flourish . However life long term has become internationally synonymous with economic development and social inclusion in reports and policy documents which set out agenda for development of an equitable Information society (1)

Information literacy has broader perspectives and applications. Although information literacy embraces related concepts like user education, library instructions, bibliographic instructions and library research. Libraries alone cannot address IL. This is educational and societal issue, and cooperative efforts of the government, non government organizations, educational institutions, community information centers and academic /professional association are to be involved.

As libraries are involved in a number of ways in supporting teaching and research in terms of resourcing, reading material, facilitating use of these materials and providing collaborative focus for partnership with other institutions they play an important role in promoting information Literacy of

the students and staff members. The focus of this paper is on the role of Academic libraries in teaching information literacy skills to the students in particular.

2. WHAT IS INFORMATION LITERACY

The first public use of the term "Information Literacy" occurred in 1974 (Bruce 1997; Webber & Johnston 2000) when Paul Zurkowski suggested the establishment of a 10 year strategic framework for achieving nation wide "Information Literacy" in his report to the US National Commission on Libraries and Information science in what is now perceived as seminal moment in the history of Information Literacy. However, the widespread use of Information Literacy followed after the publication of *ALA final report of the presidential committee on information literacy in 1989* which set the agenda in the US for the activities that followed and provided a definition of IL which is commonly quoted in reports and papers to this day (**8**).

Bruce (1997) observes that it was the emergence of the information society , characterized by rapid growth in available information and accompanying changes in technology used to generate, disseminate , access and manage that information. Which allowed the IL movement to take root and flourish (**9**)

Information Literacy can be defined as the ability to know, to be able to identify locate and evaluate the information sources. In other words it is the ability to access, process and use information effectively.

Association of College and Research Libraries (ACRL) defines Information Literacy as a set of abilities requiring individuals to recognize when information is needed and have the ability to locate evaluate and use effectively the needed information . (**10**)

3. WHY INFORMATION LITERACY

The concept of Information Literacy has its root from user instruction or user education. In large academic institutions the readers were oriented to the library services or user services by guided tours to library services or demos and written instructions. As the librarians with open access became more advanced with several types of publications, besides books for example (maps, typographic sheets, different types of reports, microfiche etc) and other technicalities in publications like merging and splitting of journals etc. The users needed additional knowledge and skills in retrieving the various types of literature scheduled in open stacks of the library and in using the reference information, especially the catalogue in an effective manner. Therefore Large academic libraries began to offer courses for library users.

The advent of Internet and other electronic and digital resources, besides, application of information and communication technologies in automation of libraries and house keeping operations has highlighted the need of information literacy to a larger extent. The use of these automated libraries and digital resources became difficult without guidance and basic skills, therefore, user instruction became mandatory to readers to provide necessary skills for best exploitation of digital resources.

According to a study by Kathryn Ray and Joan Day in students attitude towards electronic resources (1998) found it apparent that large number of students are leaving university without the necessary transferable skills to cope in an information based society. (**11**) Therefore, the students need to be trained to be information Competent. Some of the major information skills required by the students as defined by SCONUL Institutions in UK (**12**) are ;

1. The Ability to recognize a Need for Information .
2. The Ability to distinguish ways in which the information "gap" may be addressed. (e.g. kinds of resources print and non print).
3. Ability to Construct Strategies for Locating Information.
   - articulate information need and be able to match against resources.
   - understand the principle of construction and generation of databases.
4. Ability to Locate and access information
   - Develop appropriate searching techniques. (e.g. use of Boolean logic
   - Use information and communication technologies effectively, academic Networks and online databases .
   - Use appropriate indexing and abstracting services, citation indexes etc .
   - Use current awareness methods and tools to keep up to date.
5. The Ability to Compare and Evaluate Information .
   - awareness of bias and authority issues.
   - awareness of peer review process of scholarly publishing
   - retrieve information matching the information need.
6. The Ability to Organize, Apply and Communicate Information to others in ways appropriate to the situation. For example
   - be able to cite bibliographical references in project reports and theses.
   - communicate effectively using appropriate mediums.
   - understand issues of copyright and plagiarism.
   - to be able to construct personal bibliographical system.
7. The Ability to Synthesize and build upon Existing Information .
   - contribute to creation of new knowledge.

A course in information literacy integrated into the core curriculum is perhaps the best way to provide information skills to the university students and this will ensure that they leave the university as information literate citizens.

4. INFORMATION LITERACY : THE WORLD SCENE

The role of academic institutions in particular the academic libraries in promoting information Literacy is quite encouraging in the developed countries. In UK the report of National Committee of enquiry into Higher Education (the Dearing Report,1998) had emphasized the importance of skills which are key to future success of graduates on what ever they intend to do later in life. The committee identified a list of four skills ; the Communication skills ; Numerology ; the Use of Information Technology and Learning how to learn. (**2**)

The Institutes of higher learning in UK has shown evidence of impressive growth of activity in the area of Information skills development. In 1998 *Society of College National and University Libraries in UK* (SCONUL) executive board prepared a task force in Information skills for higher education students.

In US an influential report by the American Library Association (report of the presidential committee 1989) emphasized the need for all people to become information literate which means that they are able to recognize when information is needed and able to identify locate, evaluate and use effectively the needed information (3) . A national forum for information literacy has been established with representations from wide range educational organizations. The land grant pattern universities in US already have courses on developing Information Competency of students integrated into their course curriculum. Besides there are good examples of IL programs California State University, Florida International University, University of Wisconsin etc initiatives have also been made in other universities viz. Syracuse University (New York), Massachusetts Institute of Technology (MIT), Yale University, Stanford University etc.

In Australia there are examples of initiatives in universities towards a strategic approach to Information literacy development in particular for e.g. the work of Griffith University in developing Information Literacy Blueprint called the "Griffith Blueprint" the document states that effective information literacy education depends upon co-operation between information specialist and discipline experts to achieve curriculum innovations which foster Information Literacy. (4)

There has been several projects world wide in Information Literacy particularly the UNESCO co-sponsored Information literacy colloquia and meeting (Prague 2003, Alexandria 2005, and 2006) attended by over 100 experts from different countries in the world. Besides several universities in particular large academic libraries have undertaken information literacy projects to develop Information Literacy skills of their students . The Library of Chinese Academy of Sciences has done impressive work in Information Literacy and has wealth of experience. In New Zealand, the *Library and Information Association of New Zealand Aotearoa* (LIANZA) has been working with the concept of Information literacy since 1990's and developing existing user education program. to achieve broader outcomes. In 1998 LIANZA developed a task force on IL to identify core issues, challenges and opportunities facing LIANZA in area of IL and how this could be accommodated in the LIANZA structure. There have been several notable initiatives and influences within the library profession of New Zealand . The move from user education to information literacy involves two fold approach from librarians. Internally user education programs had been refined and developed and externally librarian are looking to form partnership that will create broader information literacy out comes. (5) Understanding the philosophy of user education and its purpose is being broadened and promoted thus moving from an internal library focus to more collaborative approaches focused on learner needs.

In Germany Information Literacy is quite a new topic of discussion for the German academic libraries. Few pioneers raised the topic in late 1990's but the community remained silent . Some universities for example the University Library of Konstanz started a Project in 2003 entitled Information Kompetenz I a prototype course for teaching Information Literacy at undergraduate level was formulated. Besides a set of online tutorials using ILIAS an open source platform was also developed. Another project Information Kompetenz II was undertaken in 2006 a cooperative project with Chinese Academy of Sciences with objective to analyze graduate Information Competencies ; to find Appropriate ways to Inform and teach them. (**6**)

According to a research by Anthi Katisrikou on Instruction Literacy , the state of the art in Greece. Indicates that 45% of the libraries had already established special programs offered to users on Library Instruction. The difficulties some libraries pointed out for negative response include few staff, the low budget and lack of skilled staff. Librarians believed that these initiatives legitimately have first

place in library services but significantly depends on organizations senior manager. Besides all responders agreed, that they would be willing to be taught by the teaching library in order to gain the skills. (7)

5. INFORMATION LITERACY INTIATIVES IN INDIA

In India the initiatives to make the country an information literate society has already been made in the year 2005 with the setting of a National Knowledge Commission (NKC) with a mandate to transform India of 21st Centaury in to a Knowledge Society. The government has clearly recognized public libraries playing a pivotal role in dissemination of knowledge. Academic institutions with libraries being the Institutions having information resources and staff trained in managing information sources are best centers for developing Information Literacy skills of the students and staff.

Although the role of academic libraries in particular traditional and conventional universities has been limited to orientation and library instruction few libraries have integrated into their course curriculum. Agricultural libraries are already ahead with their User education programs focused on teaching information Literacy skills to students in particular the PG s students and PhD students.

The User Education in Agricultural universities of India had its beginning from the land grant colleges of American Universities of Agricultural Sciences. The Agricultural universities in India had their roots from these colleges and follow the land grant pattern of imparting education. User education was considered important and was made part of the curricula to teach the students on use of library and its resources and to develop their information skills.

Agriculture universities started teaching library skills way back in 1970's with Indira Gandhi Krishi Vishvidhalaya Raipur (MP) being the first university followed by G B Pant University of Agriculture and Technology in 1976, and Marthwada Agriculture University Maharastra.

The idea of offering user education embedded in course curriculum was to make them information literate and acquaint them with various scientific sources of information, knowledge classification and retrieval techniques and also develop their skills and competence to be confident and self reliant in searching and retrieving information. The libraries and information centers of agricultural universities are thus discharging the function of teaching library as well administrative functions of managing information and library services.

In one of my study, N Singh (2006) on User Education and Information literacy programs of 19 Agriculture universities in India found that the course content offered to the students has been devised basically to developed the information competency skills of students. The course content has been organized into two parts, one part deals with educating users on information retrieval techniques, use of catalogues and OPAC, classification , arrangement of books, use of national and international agricultural databases, library networks and web resources; library rules, type of libraries and its services. The other part deals with research skills like preparing dissertation and reports, writing scientific references, knowledge of compiling bibliographies , technical jargons like use of abbreviations, footnotes etc. (12)

Most of the Agricultural universities follow semester system except the Indian Agricultural Research Institute(IARI) New Delhi (follows trimester system) and offer the course in the first or second semester. The courses are compulsory except for few universities like G B Pant University of Agriculture & Technology where the course is optional. In most of the agricultural universities the course is graded in the final examination. They only deficiency in these courses is lack of uniformity,

while some universities have emphasized on library and information science subject matter others have given more emphasis to technical writing . Therefore there is a need to bring some kind of an uniformity in the course curriculum and updating in view of the latest developments in libraries getting hi-tech and complex in nature and resources.

The traditional universities are yet to come with a concrete curricula based user education program for developing information skills of their students in higher education in order to meet the twin dimension of competent students and the information literate person. With National Knowledge Commission (NKC) emphasizing on educating citizens to be information literate, the libraries an information centers of traditional or conventional universities have to be proactive in formulating information literacy courses for their students based on pattern from developed countries in particular UK, US and Australia where considerable work has already been done in this regard.

Libraries require large investments and students have the right to draw maximum benefit by exploiting the resources fully. Information literacy courses makes this possible. It is high time that academic libraries of conventional universities too realizes their new role of teaching. However, the proposed development of the idea of Information Literacy requires a collaborative and integrated approach to curriculum design and delivery based on close co-operation between academic library and staff development colleagues.

Besides the academic libraries, focusing on students. The efforts made by publishers and producers of electronic resources and library associations in promoting Information Literacy is quite encouraging.

Information Literacy for Academic Staff Members

Unlike Information Literacy course for students in universities and colleges there are no formal courses for teaching/upgrading information literacy skills to teaching and support staff. The universities and research institutes have access to several digital resources on consortium or individual bases. The publishers or producers of these electronic resources train the information professionals through user training programs who in turn train their students to access and use databases effectively. Some vendors like Indian Medalars Centers of National Information Centers (NIC) conducts user training program from time to time on their on their products and services like MedIND open access journal literatures, UNcat union catalogue databases etc. Besides many academic staff colleges have been established in the universities with ideas to organize regular orientation /refresher courses for teachers and information professionals to upgrade their skills in changing environment. Some National Institute of Technology like IIT 's and documentation centers like National Social Science Documentation Center (NASDOC) and National Institute for Science Communication and Information Resources (NISCAR) erstwhile INSDOC play important role in training the information professionals in the country to acquire and upgrade their skills on retrieval techniques form time to time.

Library Associations in Promoting Information Literacy

Library Associations both at National and the State level have been promoting Information Literacy in particular for the working professionals . The Indian library association (ILA) organized the 51st all India conference on librarians , Information literacy and life long learning in December 2005. In this conference ILA also recommended to form a National Information Literacy Mission and National Information Literacy task force to implement information literacy competency program throughout the country (**13**). Another International Information Literacy workshop was held at the

Punjabi University, Patiala in India in October 2005, to promote information literacy in South and South East Asia growth with support form UNESCO and other partners.

Information Literacy in German Universities

German libraries are also in the process of fundamental change initiated by information and communication technologies . The orientation towards user expectation and user services had taken place in German libraries as a result of democratic movement and educational reforms in the seventies. The opening of formally closed stacks and expansion of reading rooms required knowledge and skills of retrieving literature shelved in open stacks and using catalogue in efficient way as a result large academic libraries started offering user education courses. After acquiring some experiences it became obvious that apart from existing expert knowledge the librarians needed pedagogical qualifications and organizational conditions to ensure efficient courses. Recommendations for these tasks were developed in a project at the end of 70's , however there had not been enough resources and initiative for a systematic and sustainable development of teaching task. During 80's the activities in the field of user education were reduced in nearly all libraries of Germany due to the reason of missing staff resources ; for systematic development of teaching activities ; neglect of users expectations and perspectives especially in forming and providing information concept ;missing adult education course for those willing to take pedagogical task etc (**14**)

New discussions and activities started at the beginning of 90's as a reaction to increasing demand for support during the introduction of new electronic information system like OPAC, bibliographical databases on CD Rom etc. this lead to the expansion of user education courses and these were pragmatic and object oriented. They were pragmatic because they were not integrated in a pedagogical concept with broad education target and object oriented because their focus was providing skills required to handle OPAC or a database. Often the course structure was derived from the hand book of the publishers or producers. These courses were self contained entities of one or two hours without any relation to other courses in methodology of content

Realizing shortcoming new activities were started at the end of nineties with focus on new pedagogic concepts and foreign developments influenced by curriculum theory ; Anglo American models of Information Literacy; online learning methods and techniques etc. A lot of teaching activities in German universities are now based on smaller curricula and learning target especially in big academic libraries . Anglo American models of information literacy are of significant relevance for extending the content and methodology of new approach in German user education (**15**). However the discussion on IL in Germany during the last few years has concentrated almost exhaustively on teaching undergraduates due to the reason that IL was quite a new topic of discussion for German Academic Libraries . (**16**) Although few pioneers tried to raise the topic in late 1990's the community did show much interest (**17**).

Bibliographic instruction took place in a very tool oriented way for example at University of Konstanz. Stand alone sessions were offered called "Using the local Catalogue" or "Introduction to databases". These sessions were not well attended by students and the libraries were not content. This description seems to be representation of most German University library (**18**)

The situation changed when Bologna process seeks to harmonies the higher education system of eth participating European Union state with vision of European higher learning education system by the year 2010. The idea of harmonizing the European system is to allow students switch between countries and universities and to improve mobility in European Higher education. (**19**)

In Germany the students had to work for 5-6 years for their first academic degree which was a Diploma (Diplom) for Masters (magister atrium). A shorter degree course such as bachelors and masters was not known. The Blogna process aims to define and implement a two level study structure similar to the one already existing in Anglo American world in the undergraduate level a bachelors degree of three years qualifying students to enter a job that could be followed by masters or doctoral.

At the University of Konstanz (Southern Germany) which I visited and interacted with the senior LIS professionals, I was informed that debate on Information Literacy started in 2002 when first bachelors curricula were designed and some department requested the subject Librarians for teaching. It was than thought that this was a unique chance to develop Librarian position towards a more research and teaching oriented focus and to improve library standing in the university. Although there had been some bibliographic instruction before a new era started at this point.

In the last few years the integration of IL in certain undergraduate curricula has been incorporated in the University of Konstanz . This has led to three basic models of teaching IL at this level (**20**)

1. Ninety- minute stand-alone sessions in subject –specific resources are still offered in most subject, but attendance remains low.
2. Course -integrated arrangement s allows the subject librarians to teach 90 or even 180 minutes sessions in a seminar run by the faculty .This is the case in subjects of sports science , ancient history or political science. The subject specialist can only show some of the most important resources , so teaching remains predominantly tool-oriented.
3. a completely new approach is a subject oriented full semester information literacy credit course that may be integrated in the curriculum. This model is already followed by five of the ten subject specialist, who cover a range of approximately twelve field of study.

The courses in Social Sciences and Humanities are offered in the first year where as in sciences, the courses are scheduled in the second or 3rd year because of the different ways the students learn to work during their time at the University. The underlying structure of the course agenda is similar in most course and covers the whole range of information literacy from research strategy via catalogue, database, internet and fact retrieval to evaluation citation , bibliographic management software etc.(**21**) .

The information literacy program of the University of Konstanz library has been appreciated by the university faculty and viewed as teaching support in the field of research and information seeking skills. With this step the library made clear the importance of teaching information Literacy as a new task for subject librarians and for the libraries as a whole . This has led to a certain change over from collection development to a more research and teaching oriented position of the subject librarian.

Besides the undergraduate courses the University Library of Konstanz from 2006 started a semester long credit bearing course for masters students of Politics and Management. The course of four credits is included in the study regulation and is mandatory for all masters students. The course content for example political science students includes full range of basic information literacy viz. Research strategy, knowledge of and searching relevant information sources in political sciences , evaluation, citation , bibliographic management software etc.

In the year 2003 the University of Konstanz started a project Information Kompetenz -I, a prototype course for teaching Information Literacy at undergraduate level was developed as well as set of online tutorial using ILIAS an open source platform. The university started another project on Information Kompetenz-II, funded by DFG in cooperation with Chinese Academy of Science to analyze graduate information competency and to find appropriate ways to inform and teach them. (**22**)

The situation of information literacy at the University of Konstanz can not be generalized for all the German Universities. There are still a variety of different approaches between universities and libraries in teaching IL from stand alone presentations to course embedded sessions and complete credit courses. For example the University of Applied Sciences in Hanover, and the Hanover University (Lower Saxony) which I also visited and interacted with the professionals. The course for teaching Information Literacy has not been integrated in the course curriculum. How ever the discussions are still in progress to include the same into regular course curriculum of the undergraduates and post graduates students.

The University of Applied Sciences , Hanover, offers five credits course for engineering students recognizing the fact that Information Kompetenz (in German) or Information Literacy is an important key qualification for efficient and effective supplement to their main study (engineering sciences) as well as central resources like library which will help in future for job entrance and work place (**23**) The course content focuses on ability to recognize the need of information, to formulate search strategy, locate right information, evaluate and use effectively for problem solving.

At the Hanover University library, and the National Library of Science and Technology (the TIB), I was informed by the coordinator of Information Literacy program that inclusion of Information literacy into the core course curriculum was under active discussion with the faculty and to offer through blended learning by integrating into e-learning mode. At Lippe and Hoezeter University the situation is different, although information literacy is one of the key competencies for learners there are difficulties in getting implemented into regular course curriculums for the reasons of common consensuses among the faculty members. Out of nine departments the course is integrated into only one department i.e. of Landscape Architecture and Environmental Sciences. The situation of IL in other German University libraries are into different phases of implementation and needs to be further explored. The universities are in transition to implementing the Bologna process of harmonizing the higher education system to define and implement a two level study structure of bachelors and masters degrees to students.

As already existing in Anglo American world. Some universities, for example the university library of Konstanz recognized the possibility of including IL as a key competence at a very early stage of the process .

6. CONCLUSION

Teaching Information Literacy (IL) is not a new role for the working library professionals in India. The librarian have been doing so in a very general way by orientation or user instruction at the beginning of the academic session. Although the concept of IL has roots from these user oriented programs, it has not gained much attention or interest from the working LIS professionals in particular the traditional or conventional universities, and other engineering and management institutes. The situation of Agricultural universities in India is different, as these universities had their roots from American land grant pattern universities. Teaching library or user education had been integrated into the course curriculums . However these courses now requires more refinement, owing to the growth of electronic information and the internet besides, the changing socio economic and educational demographics. It is also just not sufficient for the users to be able to use the libraries and the information they provide. They must be information literate with skills to be able to identify, locate and use all kinds of information as per their need even after leaving the University.

The university libraries in Germany are into different phases of implementing IL course into their UG and PG course curriculums. While some universities like the University of Konstanz library has made clear the importance teaching Information Literacy as a new task for subject librarians and library as a whole. This has lead to a certain change form the role of information managers to more research and teaching oriented position. The situation at the university of Konstanz cannot be generalized for other German university libraries. Many universities viz. the Hanover university and university of Applied Sciences are in the process of active discussions on getting the course integrated into the regular course content.

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