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Knowledge Organization in Digital Environment in Libraries (KODEL): Introspect and Prospects



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- 49th All India Library Conference Seminar Papers on "Responding to Users' Need in Changing Information Landscapes: Sojourn of Libraries from Palm-Leaf to Palm-Top". Jhansi (UP), December 29, 2003 to January 1, 2004. Edited by Prof (Dr) N Laxman Rao, Dr (Mrs.) Ashu Shokeen, Dr U C Sharma, D V Singh and Dr R K Bhatt. Rs. 800/- (Hardbound); US $ 100.
- 48th All India Library Conference Seminar Papers on "Electronic Information Environment and Library Services: A Contemporary Paradigm". Bangalore, January 22-25, 2003. Edited by Dr Pandey S K Sharma, Akhtar Parvez, Dr (Mrs) Ashu Shokeen and D V Singh. Rs. 1000/- (Hardbound); US $ 100.
- 47th All India Library Conference Seminar Papers on "Library Practices for Effective Management". Warangal, December 20-23, 2001. Edited by Kalpana Das Gupta. Rs. 995/- (Paperback); US $ 99.50.
- 46th All India Library Conference Seminar Papers on "Quest for Quality: Quality Assurance in Library and Information Services: The Need of the Hour for Survival". Ahmedabad, Jan 3-6, 2001. Edited by S M Dhawan. Rs. 995/- (Paperback); US $ 99.50.
- 45th All India Library Conference Seminar Papers on "Indian Libraries and Librarianship in Retrospect and Prospect". Edited by J L Sardana. Rs. 760/- (Paperback); US $ 75 & Rs. 950/- (Hardbound); US $110.
- National Seminar on "Challenges before the University Libraries in India in the 21st Century". M S University of Baroda. August 9-12, 1999. Edited by J L Sardana. Rs. 700/-; US $ 70.
- 44th All India Library Conference Seminar Papers on "Libraries and Information Services in the Electronics Information Era". Hyderabad, February 25-28, 1999. Edited by J L Sardana. Rs. 700/-; US $ 70.
- 43rd All India Library Conference Seminar Papers on "Sustainable Library and Information Services". Chandigarh, November 5-8, 1997. Edited by T A V Murthy, N Datta and R P Kumar. Rs. 650/-; US $ 65.
- 42nd All India Library Conference Seminar Papers on "Role of Libraries in National Development". Calicut, December 21-24, 1996. Edited by R P Kumar, Divya Srivastava and S P Gupta. Rs 650/-; US $ 65.
- 41st All India Library Conference Seminar Papers on "Human Relations is Librarianship". Vijayawada, January 7-10, 1996. Edited by P S G Kumar and C P Vashishth. Rs 600/-; US $ 60.
- 40th All India Library Conference Seminar Papers on "Preparing Libraries for the 21st Century". Goa. January 5-8, 1995. Edited by C V Subbarao. Rs. 600/-; US $ 60.
- 39th All India Library Conference Seminar Papers on "Library Movement and Library Development in India". 1994. Edited by C P Vashishth. Rs. 600/-; US $ 60.
- 38th All India Library Conference Seminar Papers on "Library and Information Technology: In Pursuit of Excellence". Bhubaneswar, November 21-24,1992. Edited by C P Vashishth, O P Sharma, A P Gakhar, and Dr Dev Raj Singh. Rs. 500/-; US $ 55.
- Model Public Libraries Act 1991. Rs 100/-; US $ 20.
- 37th All India Library Conference Seminar Papers on "National Information Policies and Perspective". 1991. Edited by K S Raghvan. Rs. 400/-; US $ 50.
- 36th All India Conference Seminar Papers on "Computerization and Library Network". Edited by C P Vashishth. 1990. Rs. 400/-; US $ 50.
- 35th All India Conference Seminar Papers on "Standardisation in Library and Information Work and Services". Edited by C P Vashishth. Rs. 400/-; US $50.
- College Libraries in India: Proceedings of National Seminar. Edited by Krishan Kumar and J K Anand. 1988. Rs. 250/-; US $ 40.
- 33rd All India Library Conference Seminar Papers on "Modernisation in Libraries". 1988. Edited by C P Vashishth. Rs. 500/-; US $ 50.
- Year's Work in Indian Librarianship 1987. Written and Edited by T S Rajagopalan. 1988. Rs 250/-; US $40.
- 32nd All India Library Conference Seminar Papers on "Quality in Libraries". Anantpur, January 3-6,1987, Edited by C P Vashishth. Rs. 400/-; US $40.
- Continuing Education for Librarian. Paper for the All India Seminar held on February 12, 1984 at Pragati Maidan, New Delhi. Edited by J L Sardana. Rs. 200/-; US $ 40.
- 28th All India Library Conference Seminar on "Public Libraries in a Developing Society" and "Planning for National Information System for India". 1982. Edited by J L Sardana, Mohinder Singh, O P Trikha, N N Mohanty. Rs. 200/-; US $ 40.

FOREWORD

The ability to communicate by means of speech, through the medium of written word and the mental process of grouping (organizing) which is basic to human beings distinguishes man from animals. Man tried to preserve knowledge by variety of media available during that particular period such as oral transmission from person to person, recording formation on stone, clay tablets, metals, birch bark, parchment, papyrus, palm leaves, paper, etc.

Invention of printing by John Guttenberg in 15th Century heralded the first information revolution; technologies like pictorial image, recording and transmission of sound, telephone, radio, cinema and wireless broadcasting were responsible3 for ushering in the second information revolution; and Developments in computers, networks, application of hypertext principles, CD – ROM and DVD as mass information storage devices, and mobile phones technologies have revolutionized the entire way of living lead to third information revolution which transformed the agrarian society into industrial society and finally into 'information society' or ' knowledge society' where knowledge is attached the foremost importance.

Organization of knowledge is as old as human civilization. Earlier knowledge was the embodiment of a few individuals like Aristotle, Socrates and Plato. Aristotle and his disciples were great systematizes of domains knowledge of their time. Philosophers like Francis Bacon and editors of encyclopedia in 17th century searched for ways to organize growing bodies of knowledge and their disciplines by providing indexes and linking related knowledge through cross-references. Later on when man started exploring more and more knowledge around him, he felt that the knowledge is growing beyond the comprehension of single individual and realized the need for its organization to understand it better and was in search of better tools to organise the knowledge.

Over the years librarians evolved various classification schemes to convert the dynamic, multidimensional, multifaceted, multidirectional and ever expanding knowledge into one-dimensional notation to arrange the documents on the shelves. Due to the advent computers and communication technology it is possible now to visualize the 'Global Digital Library' a way of

thinking about the access to information in an internationally distributed computer network. The global information infrastructure presents a wealth of opportunities for providing information resources to people around the world. At the same time, it poses several technical, social, and policy challenges. The main trends identified in the design of digital libraries were from metadata to data, from independent to linked system, from searching to navigation and from individual to group processes.

There are numerous attempts to establish order and apply organization to the chaos of the Internet and the World Wide Web. Anyone who has conducted a search on the Web will immediately realize the difficulty in retrieving relevant results. In evaluating all the possible methods to achieve the task of organizing the Web, perhaps one should consider the Colon Classification as a candidate. The problems inherent with the physical classification will disappear when we consider the environment of the web, since we do not have to worry about the "physical" location of a document. The laws, principles and canons enunciated by Dr S.R. Ranganathan are still and most relevant in the organisation of knowledge in the digital era. A lot of research has to be initiated in this regard to find suitable tools, which enable the librarians to organize the knowledge contained in variety of forma and media with ease. Over a period of time librarians and computer specialists lived in islands thinking parallel having their own terminologies, which are substantially identical. What needs to be done now is the integration of both the communities and sharing each other's knowledge to tackle the problems effectively and efficiently.

Libraries will continue to select, collect, organise, conserve, preserve and provide access to content available in variety of media. The new digital media offers opportunities as well as challenges for the librarians to improve the form and distribution of knowledge content.

Every new technology brings a change associated with problems. It is an on-going problem. We should always be willing to learn, create knowledge base, imbibe, assimilate, and adapt ourselves to the changing technological developments and ever increasing demands and expectations of user community and march ahead.

The Indian Library Association is organising its 50th All India Library Conference with the main objective of bringing the librarians across the country on single platform to address the

most challenging issues the libraries are facing in the digital era. The main theme of the conference is "Knowledge Organisation in Digital Environment in Libraries: Introspect and prospects" with nine sub-themes. I take this opportunity to congratulate Dr Kautilya Shukla, Organising Secretary and University Librarian, Smt. Hansa Mehta Library, The Maharaja Sayajirao University of Baroda and his able team for hosting and organizing this conference, editorial members for bringing out the proceedings volume in a meticulous way and all office bearers of ILA for their valuable help in organising this conference. I wish the 50th All India Library Conference a great success and hope that the deliberations will greatly benefit the delegates.

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PREFACE

We are happy to present before you the Pre-Conference Papers of the Golden Jubilee All India Library Conference being held at Baroda, is a place in the field of Library and Information Science in the country where Library movement, Library Education, Library Association and Library Literature were initiated way back in the first quarter of the Twentieth century. In the second half of last decade, with proliferation of Information and Communication Technologies, in particular the Web, offer exciting possibilities for the librarians to deliver information to the users' desktops and integrate library services using web as the common user interface. A librarian can contemplate several interesting services over an intranet or Internet such as Web access to catalogues and in-house publications, e-mail delivery of current awareness and SDI bulletins, local Web access to externally purchased databases, consortia based e-journals, CD-ROM databases, remote information services, etc.

Apart from information itself playing an important role Internet, which forms the most important media of presentation of information in various forms has actually influenced the roles of information professionals. Internet presents lots of challenges to our profession and it is up to us to accept these challenges and re-define our roles in the new era. Internet represents the most fertile and untapped frontier where information professionals can add value for the Internet related industry to realize the potential of our profession. They need both content and context, two attributes that are part of the domain knowledge of the information professionals. Internet and the digital revolution pose even more complex problems for copyright law. The three technological advances, namely, the digitization of information, networking and worldwide web have turned the economics of information upside down. Digitization of information has changed the economics of reproduction; networking has changed the economics of distribution, and the World Wide Web has changed the economics of publication. The Internet is being used globally by an increasing number of publishers to further promote their publications to the international community of scientists and technologists. The libraries and information centres will benefit greatly from this technology-driven revolution.

Information explosion and the advancement in various technologies have changed the traditional method of dissemination of information. These new technologies have given birth of concepts like digital libraries, e-libraries, virtual libraries, etc. which requires re-engineering of Knowledge organization in the Library. Access to information through faster communication using the digital devices or electronic media are unavoidable across the globe and Library and Information Science Profession is not an exception to it. The concept of Digital Libraries is emerging as a crucial component of Global Information Infrastructure with the help of various digital devices and the ways to provide users information effectively and efficiently. Digital libraries and Knowledge Organization can assist in the ongoing process of scientific and technological development by disseminating effective and value-based information. Issues related to the Organization of Knowledge in Digital Environment need to be assessed and planned for the future.

The present phase with all the rapid developments in computers and telecommunication technologies and the networking power of Internet, Intranets and Extranets seems to be a period of rapid change – a paradigm shift – for information professionals and information centers. This possibly can be viewed as a beginning of a new age for the profession where information professionals are at an intersection of applying information science to information technology. This is a challenge facing our profession. There are advancements every day in the field of information technology and everyday brings us new evidence about the importance of e-commerce, e-business, e-governance and the general shift towards a digital economy. Information plays an important role in all this and forms the central, creative and supportive part of business, government and education. This situation has forced LIS professionals to work more on knowledge Organization. As the librarianship moves steadily from print to digital media, it has become necessary to develop techniques and mechanisms that facilitate users to effectively and efficiently discover relevant digital resources for purposes of decision making, problem solving, learning, etc.

Considering this new challenge facing the profession as a whole, the Indian Library Association decided to organize its 50th All India Library Conference on the emerging theme "Knowledge Organization In Digital Environment In Libraries (KODEL): Introspect And Prospect". The conference is being held at the Maharaja Sayajirao University of Baroda in Vadodara from 1st to

4th December 2004. To help and promote exchange of views on "Knowledge Organization" among the professionals working in different environments such as academic, public and special libraries across the country.

We have received an overwhelming response from the LIS professionals by way of contributing papers for this conference. We had received considerable number of articles. The editorial committee reviewed them thoroughly and short-listed. The volume contains 109 papers inclusive of 47 abstracts (because of space constraints), which are summarized under various sub-themes (except Sub-theme V) as below:

Sub-theme I: Building Knowledge Organization Culture

This section has nine papers including four abstracts on the various components of the sub-theme viz. Interdisciplinary behaviour of Knowledge Organization; Emerging of Digital Culture and measuring Knowledge Organization and its problems.

Sub-theme II: Cross Culture

Eight papers have been included in this section including four abstracts on the various topics of the sub-theme viz. Library and Technology; Managing Information with the tune of Technology in Knowledge Organization.

Sub-theme III: Media Migration

This facet has seven papers including three abstracts on diverse areas of the sub-theme viz. Print to Electronic Media; Free and exhaustive flow of information through varied media: impact and implications.

Sub-theme IV: Digital Environment

Thirty papers have been dealt in this section including seventeen abstracts on the diverse areas of Role of Libraries in Digital Environment; E-libraries, Virtual Libraries and Digital Libraries.

Sub-theme VI: Tools And Techniques For Information Handling

This facet has fifteen contributions including six abstracts on the various components of the sub-theme viz. Impact of Technological

advancement on Library and Information Services: Tools and Techniques in Knowledge Organization.

Sub-theme VII: Networking And Security Aspects

Sixteen papers have been included in this section including seven abstracts on the various facets of the sub-theme viz. Internet, Intranet, LAN, WAN, MAN, wireless technologies and topologies; e-resources authenticity, security, Security devices in Network environment and for conventional documents.

Sub-theme VIII: Human Resource Development

This section has also has seventeen papers including four abstracts on the various components of the sub-theme viz. Human Resource Development for Digital Environment for Libraries and Information Centres; Impact of Technology on curricular development: Need for Professional up-gradation, In-service training, Re-engineering of Library operation and services. Preparing Manpower for Digital Environment and training of Library and Information Clientele.

Sub-theme IX: Plan, Policies And Standardization For Digital Archives

In the final section seven papers have been introduced including two abstracts discussing the various components of the sub-theme viz. Developing Policies for Digital world of information; Legal issues pertaining to IPR, Copyright, Classified information, Issues pertaining to importance of National, Regional and Local Archives in the context of Globalization.

Printer M/s Om Laser Printers, Delhi have done a wonderful job, in spite of a short notice of time. The Editorial Committee takes this opportunity to congratulate and thank both authors and printers for their cooperation in this regard.

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

It is heartening to note that the Conference was directed by an eminent and renowned professor in Library and Information Science, Prof. N. Laxman Rao and various technical sessions were chaired by professionals of eminence. We trust the

discussions during the conference will lead to a fruitful exchange of ideas and these proceedings will prove to be a useful collection of the description of the state of the art practices in "Knowledge Organization" developed in the country.

We are eagerly looking forward to have pleasant association with the delegates of the 50th ILA conference.

Dr. (Mrs.) Ashu Shokeen
Chief Editor

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ABSTRACT

The Information Explosion and Information Technology revolution has led to the emergence of the electronic information era. Rapid advances in information processing, storage and communication technologies have revolutionized the role of worldwide libraries in disseminating information services to their users. 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. n order to fulfill the above objectives the concept of digital library is emerged in the literature of Library and Information Science. This presents the digital library, advantages, functional components of digital libraries, digitalization process and its problems in Indian libraries, and role of digital libraries in the future.

From DDC to Dublin Core: The Spectrum of Library Statics and Dynamics

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ABSTRACT

Today we find ourselves in thick soup of terminological turmoil. Various buzzwords, such as data mining, text mining, speech mining, web mining, metadata, taxonomy, ontology, etc. are adding more confusion to the minds of people who are less techno-savvy. In fact, it is the case of old wine in new bottles. Though cataloguing, classification, and indexing are the best practices for knowledge organization, yet the new formats are bringing with them new terms and techniques for managing chaos on the Web. In fact, there has been a shift from community-centred libraries to format-based libraries, yet knowledge organization has been the heart of the matter. The purpose of the paper is to highlight this transition and encapsulate professional response to this phenomenon. It identifies the challenges, opportunities and trends, and at the same time also addresses various issues facing the profession. The paper concludes with the assumption that access management is an essential condition for success management, but access management is not possible without knowledge organization.

1. PEEPING THROUGH THE PAST

The concept of library as a social utility came into practice only after the fine tuning of the printing press by Johannes Gutenberg. With printing press started the process of mass production of

books and democratization of knowledge. We have moved from scribing to e-publishing through printing. Library as a social utility has to preserve the past, serve the present, and build the future. From Gutenberg to Gates, the mission of the library as a metaphor of memory of mankind has been to support the mission of the parent body. Library's mission and its users are the library statics. Nevertheless, its role has expanded from preservation to access. Therefore, library as a metaphor of our memory refuses to run into oblivion. In spite of the ascent of the Internet and the Web, we are still managing traditional libraries, digital libraries, virtual libraries, and hybrid libraries. We are also at pains to decipher the meaning of various concepts, such as information, knowledge, wisdom, management, quality, and innovation. At the same time, we are deeply concerned with the domain of concepts, such as information management, information resource management, knowledge management, knowledge organization, content management, and context management. If we look into the semantics of these concepts, we come to the conclusion that we are, in fact, dealing with library statics and dynamics. Hypermedia and multimedia along with various other formats, such as CDs and DVDs are the dynamics of this metaphor. There has been a shift from community-centred libraries to format-based libraries, yet knowledge organization has been the heart of the matter. Therefore, we must not be scared of the buzzwords and technology-based emerging concepts.

2. ASCENT OF INTANGIBLES

Every society had its own critical resource, such as labour for agricultural society, capital for industrial society, and information for the emerging information society. In fact, information has become our fourth need after men, money and materials. It is the ascent of intangibles, i.e. knowledge and information, which makes the real difference in decision making and problem solving. Therefore, these intangibles must be organized to the entire satisfaction of the stakeholders. We have moved from facet analysis to Boolean operators in the context of knowledge organization and retrieval. From DDC to Dublin Core, we have seen many landmarks, such as UDC, BC, CC, Sears List of Subject Headings, Thesaurofacet, LCSH, POPSI, PRECIS, AACR, CCF, MARC, BSO, and ISBD. All these landmarks have made solid contribution to the field of knowledge organization. Today, neither concept classification, concept indexing, citation indexing, nor descriptive cataloguing have become relics of the past, nor the Natural Language Processing (NLP), keyword

indexing, metadata standards, and Dublin Core have become harbingers of the future.

3. SKELETON IN THE CUPBOARD

In fact, we are surrounded by many educational, cultural, technical, technological, socio-economic, political and psychological changes. Different categories of professionals have responded differently to these changes. Those who have tried to create and lead change are thriving in the networked society, but those who have resisted change are disappearing into oblivion. But library and information profession has responded to these changes in a judicious manner. In the context of knowledge organization, we have learned from our mistakes to follow the best practices. Classification schemes, cataloguing codes, indexing systems, and thesauri have been our tools to organize knowledge available through print-on-paper publications. Classification, cataloguing, and indexing have been our best practices for the print-based environment and will continue to be in the networked environment also. In fact, these processes and practices are more the mind-set of the majority of the professionals, which is not changing with the changing environment. Instead of developing an attitude to learn and unlearn, they are not ready to come out of the cupboard, which is full with their incompetence. In the context of the Internet and the Web, the skeleton in the cupboard is the incompetence of these professionals, who are unable to manage the junk available via the Web. One gets thousands of links to exotic information but fails to get single hit in case of esoteric information. This is happening because we are heavily depending upon Boolean operators in online searching. Therefore, continuing professional education and training is a pre-condition for managing chaos on the Web, and enabling the professionals to come out of the clutches of the skeleton in the cupboard.

4. SHUDDER IN THE UDDER

But there should not be any shudder in the udder because of the information pollution that is taking place in the public domain because of the lack of quality control. This pollution is taking place only in the public domain, but the dot coms, such as Emerald Insight, and utilities like OCLC have done wonders in the field of knowledge organization. Therefore, the only thing is that we are required to fine tune our knowledge organization tools, processes, and practices according to the nature of digital documents. These documents are malleable, vulnerable, superficial, highly selective,

and exclusive. These documents transmute into one another at a rapid rate, e.g. it is very difficult sometimes to organize an email message, electronic newsletter, and an electronic journal. Our tragedy is that we have been trying to organize the knowledge available via the digital documents with the help of traditional tools. That is not a good practice. Efforts are being made to develop various formats, standards, and tools to manage chaos on the Web and organize knowledge through digital documents. MARC 21, CCF, and Dublin Core are select by-products of this endeavour. In case of printed publications also, we have been able to develop one version of the AACR to facilitate universal bibliographical control and universal availability of publications. DDC, UDC, BC, CC, LC, PRECIS, POPSI, Sears List, Library of Congress Subject Headings, and various thesauri are the tools, which refuse to sign off in the digital environment. One thing should be quite clear that we are not concerned directly with the tacit knowledge; rather we are concerned with the explicit knowledge available to us via printed publications and digital documents, along with embedded knowledge rooted in various information and communication technologies. Our job is to add value to our information/ knowledge resources and services. That is possible only through knowledge organization.

Knowledge organization is not a new concept. We already had professional publications, such as 'Organization of Knowledge in Libraries and the Subject Approach to Books' (1933) by H.E. Bliss' and 'Putting Knowledge to Work: An American View of Dr. S.R. Ranganathan's Five Laws of Library Science' (1973) by Pauline A. Atherton. Moreover, we have been in the business of knowledge organization and information dissemination. Hence we should not be awed by the new buzzwords; rather we should develop our knowledge organization skills to make ourselves competent professionals. The philosophy and theory of Dr. S.R.Ranganathan is becoming more relevant in the digital context.

5. PILLARS OF KNOWLEDGE ORGANIZATION

There is a shift from stand alone libraries to library and information networks, from intermediary to end-user, from ownership to access, and from linear to non-linear mode of access to knowledge and information. The Internet and the Web are the by-products of the confluence and convergence of the information and communication technologies (ICTs). End-users are becoming immune to the instability and transmutation of digital documents. Content management, information consolidation and repackaging,

customization and personalization are the cutting-edge responses to the challenges of access management. Since no two end-users are alike, hence their information and knowledge needs can also not be similar. Therefore, besides developing our knowledge organizational skills, we should also be intelligent enough to understand the affective and cognitive information needs of the end-users. We must develop intranets, portals and gateways that are directly relevant to the information needs of the communities of practice (CIP), but these should be based upon the pillars of knowledge organization, i.e. classification, cataloguing, and indexing.

6. FACING THE FUTURE

Growing information deluge, declining library budgets, rising prices of publications, diversifying information needs, increasing specializations, multiplying formats, insecurity, instability, technological obsolescence, and competency building are a few challenges being faced by the library and information professionals. But shared subscription, library consortia, and resource sharing via networking are the opportunities available. Various search engines, portals, formats, standards, and metadata initiatives are the trends and strategic responses to knowledge organization. Both knowledge and library are free from the traditional constraints of 2x4. Knowledge is not now available only between the two covers of a book and within four walls of a library. E-books and hybrid libraries are the leading edge of the day. Library, in fact, is a concept and not a place. Information/knowledge is available to anyone, anywhere, at any time, provided the stakeholder has pertinent skills and is in a position to pay for the connectivity and the content. But the biggest challenge is how to safeguard the threatened antelope, i.e. the quality of the content. Equality and equity of access are also the issues, which need immediate attention. We must have appropriate suprastructure and infrastructure to expose the 'have nots' to the organized body of knowledge. Customization and personalization of knowledge and information are also essential for satisfying the end-users for facing the future boldly, the future, which is really uncertain. All this can be done only by following bottom-up approach, i.e. getting feedback from the end-users about the value of our knowledge organization patterns. For this purpose we will have to follow a holistic approach to knowledge organization by keeping track of the semantics and the syntax of the concepts and terms. Key concepts, keywords, and key processes in knowledge organization will make the real difference.

7. CONCLUSION AND SUGGESTIONS

It is safe to conclude this paper with the thesis that the mission of the library is intact and will remain static, but the dynamics of the library, i.e. the formats, the tools and the techniques will change. The only way to deal with these dynamics will be the competency and capacity building. Access management will be a pre-condition for success management, and access management will not be possible without knowledge organization. Proper knowledge organization will be possible only when we have appropriate tools and techniques which take cognizance of the equivalence, hierarchical, and associative relationships among concepts and terms. It will not be possible to organize knowledge available via the Web and digital documents with the help of traditional information processing tools. We will have to develop cutting-edge tools to manage chaos on the Web. There is no need to organize the whole of the invisible web. The best strategy would be to fully organize the sustainable knowledge with the help of our standard tools and best practices. Less enduring body of the web-based knowledge and information can be looked after by the metadata standards, and the remaining part of it can be left at the mercy of various search engines. But classification schemes, cataloguing codes, and indexing languages will continue to play a pivotal role in knowledge organization. We can never afford to ignore this reality.

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KNOWLEDGE MANAGEMENT AND ITS NEED IN CHANGING ENVIRONMENT IN MODERN LIBRARIES

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ABSTRACT

Knowledge management is becoming of increasingly recognized as a critical source of competitive advantage. The way of modern libraries and information center's are use knowledge and learn is increasingly being recognized as central to performance improvement. Most extant knowledge management systems are constrained by their overly rational, static and contextual view of knowledge. Effectiveness of such systems is constrained by the rapid and discontinuous change that characterized new organizational environments. The prevailing knowledge management paradigm limits itself by its emphasis on convergence and consensus-oriented processing of information. By underscoring the need for synergy between innovation and creativity of humans and the advanced capabilities of new information technologies, this article advances current thinking about knowledge management. The paper also discussed why does need modern knowledge management in changing environment and tools for Knowledge Management and so on.

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ABSTRACT

Knowledge is an asset but its effective management require investment of other assets. The concept of librarians, library officer, information scientists has got minutiae to keep its myth for longer journey of information age in the present cutting edge of Information Technology. Knowledge management has its roots in the several disciplines including data modelling and simulation, organisation behaviour, information management and behavioural sciences etc. Knowledge management encompasses, identifying and mapping intellectual assets within the organisation thereby generating valuable knowledge capital for competitive advantages within the organisation. The paper aims at presenting holistic views of changed phenomenon from the stored knowledge to ultimate resource of knowledge assets of any organisation through the nodes of information process and activities. Knowledge is a fundamental factor in present day, knowledge management driven economy its successful application helps organisation deliver creative product and services.

KNOWLEDGE MANAGEMENT – AN EXPERIENCE AT REGIONAL RESEARCH LABORATORY, JORHAT

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ABSTRACT

The present paper discusses the trend of collection development at the Library & Documentation, Regional Research Laboratory, Jorhat during 1990-91 to 2003-04 and experience of knowledge management in a special library attached to a multidisciplinary Research and Development laboratory with special emphasis to e-journal subscription vs. growth library budget is recorded.

1. INTRODUCTION

As a consequence of the 'digital revolution' in recent years, much research has been conducted upon information organization; representation, with its resulting 'meta-data'; retrieval; and use. However, the extent to which organizing, representing, or retrieving information will benefit information users depends inherently on the collections of content upon which these activities are performed.

The selection process includes decision to include an item of content such as a journal into a library collection. "It is a large process of collection development activities which is termed as 'gateway' phenomena"(Edgar, 2003) because they create and maintain collections of content items which are then organized and cataloged to support search and retrieval by library users.

Here comes the conflict. As a library professional it is ethical to maintain the existing collection and try to add more and more to the current subscription list of journals so as to satisfy the needs of the clientele. But the budgetary restrictions and inflation on the other hand compels librarians to delete journal titles subscribed every year. In fact, Osburn says that "a very strong argument could be made that the theory of librarian-ship does reside in an undiscovered theory of collection development [of which selection is a part], and that the tardiness of the profession to address collection development matters per se is directly responsible for its inability thus far to arrive at a satisfactory theory of librarian-ship" (Edgar, 2000) . In the recent years the nature of problem of knowledge management is adding up new vistas due to the growth of information technology. "Newer media are being used for distribution of knowledge and usual procedure followed by libraries for storage, retrieval and processing information become obsolete" (Thakur & Thakur, 2003 and Raza & Eqbal, 2003). "Impact of Internet on knowledge management through electronic storage and retrieval, etc becomes an important issue for the libraries"(Mishra, 2002). Further, along with the proliferation of knowledge and growth of newer multidisciplinary disciplines there has been tremendous growth of publication of both macro and micro documents. "To maintain the role of key player in the new environment the library professionals must understand the IT systems well"(Vyas & Singh, 2004). "Management of digital data needs specific software and hardware and also understanding of their advantages and limitations, which the libraries have to acquire" (Munnolli, 2004).

The present paper discusses the trend of collection development at the Library & Documentation, Regional Research Laboratory, Jorhat during 1990-91 to 2003-04 and experiences in the process of knowledge management.

2. LIBRARY BUDGET vs. COLLECTION DEVELOPMENT TREND

Library does not have its own earning sources. The source of money is only the budgetary allocations made by the parent institution every year. Further, since it is not an individual library, all expenditures for building, furniture and fixings, lighting and provisions, binding of books and journals, staff salary and other payments are met from the institution's main budget. So, the budget of the library is meant for purchase of books and journals only.

According to the recommendations of the Good Office Committee, Ministry of Commerce and Industry, Government of India, library should get 10-12% of the institution's annual budget and there should be a regular increase of budget by at least 10-15% over the last year's budget. The price of books and subscription rates of journals are ever increasing due to increasing cost of involved materials, motive of publishers to earn more profit and also fluctuation of foreign exchange rates. The last one is creating problems after 1975 till 1998 due to frequent devaluation of rupee against US Dollar, Pound Sterling and Deutsche Mark mainly to Indian libraries as major portion of books and journals procured by special libraries are from the western developed countries. During 1998 and till present the exchange rates of above currencies are maintaining stability due to change of governmental policies and adaptation of new financial rules. So, to meet the enhanced price of the reading materials the budget of the library should increase by 15-20% every year so that the library can maintain the collection of reading materials volume constantly. But in practice, it is not happening and many a times the library has to delete journals from its regular subscription list due to imposition of budget cut and also non-commensurate increase of budget with the increase of subscription price.

The budget allocated to the library during years 1990-91 to 2003-2004 and their comparison with that of the institution are shown in table 1 and figure 1 below.

Table 1 Budget of the RRL Library, Jorhat and their ratios of increase (Rs. in Lakh)

Years	Library's budget	RRL, Jorhat budget	Ratio of library budget to RRL, Jorhat budget	Proportion of increase of library's budget	Proportion of increase of RRL, Jorhat budget
1990-91	15.00	486.38	3.10%	---	---
1991-92	17.00	455.03	3.75%	13%	-7%
1992-93	22.00	597.03	3.70%	17%	31%
1993-94	31.00	607.80	5.10%	41%	2%
1994-95	35.00	736.26	4.75%	13%	21%
1995-96	41.00	871.59	4.70%	17%	18%
1996-97	41.00	823.87	4.98%	0%	-5%
1997-98	50.00	883.96	5.67%	22%	7%
1998-99	50.00	904.09	5.53%	0%	2%
1999-00	51.00	1321.84	3.86%	2%	46%

2000-01	53.00	1276.02	4.15%	4%	-3.5%
2001-02	60.00	1357.95	4.42%	13.2%	4%
2002-03	60.00	1210.19	4.96%	0%	-17%
2003-04	60.00	1372.34	4.37%	0%	13%

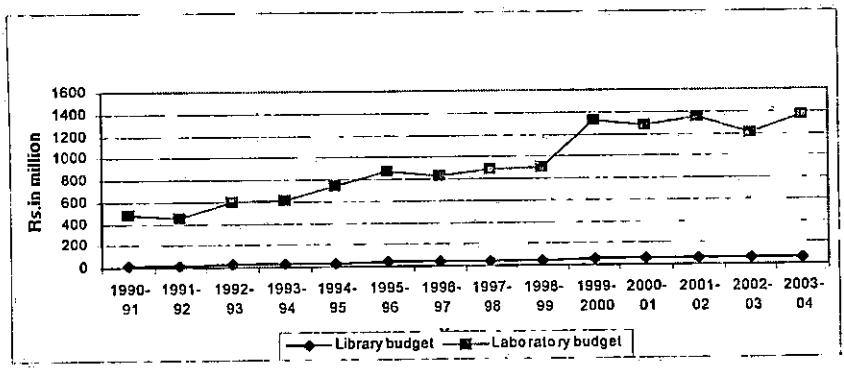


Fig.1 Trend of budget of RRL Library vs. Laboratory

The allocated budget is used for purchase of books, standards, reference tools, purchase of back volumes of journals and subscription to journals. Being a special library, lion share of the allocated budget is spent for subscription to journals. Fig. 1 shows the trend of increase of library's budget and is compared with expenditure in purchase of books and subscription to journals. A growing trend of expenditure for purchase of books can be seen during 1990-91 to 1995-96 but it is diminishing in the later part of the period due to sharp increase of subscription rate of journals, which consumed major portion of the total budget of the library.

Now, after 2001, the scenario is further changing. The library has become a member of CSIR E-journal consortium. The consortium is providing on-line e-journal access to 1800 S&T journals published by Elsevier Science. Table 2 presents the list of Elsevier Science journals in 2001 subscription list.

Table 2 List of Elsevier Science journals in 2001 subscription list

Sl. No	Title of journals	Value of Subscription in 2001in US$ / Rs.	
1.	Cement & Concrete	$1,761.00	Rs. 82,959.00
2.	J Asian Earth Science	$ 842.00	Rs. 38,816.20
3.	Phytochemistry	$ 3,421.00	Rs.1,61,159.00

4.	Tetrahedron	$12,406.00	Rs.5,86,804.00
5.	Tetrahedron Asymetry		
6.	Tetrahedron Letters	$ 9,036.00	Rs.4,27,403.00
7.	Applied Clay Science	$ 635.00	Rs. 29,914.00
8.	Separation & purification tech	$ 887.00	Rs. 40,890.70

Eight journal titles shown in table 2 were in the current subscription list journals from Elsevier Science during the year 2001 and the Laboratory agreed to continue these print subscription till 2006, for which library paid an amount of Rs. 21 lakhs as subscription in the year 2001-02. Against this, it is true that, library is benefited by getting 1800 important S&T journals on-line for the current year and five year back in full text in stead of only eight titles subscribed by the library. But as a terms and condition of the consortium the library must continue these eight journals in printed form till the year 2006 in spite of increase of subscription price every year as shown in Fig. 2.

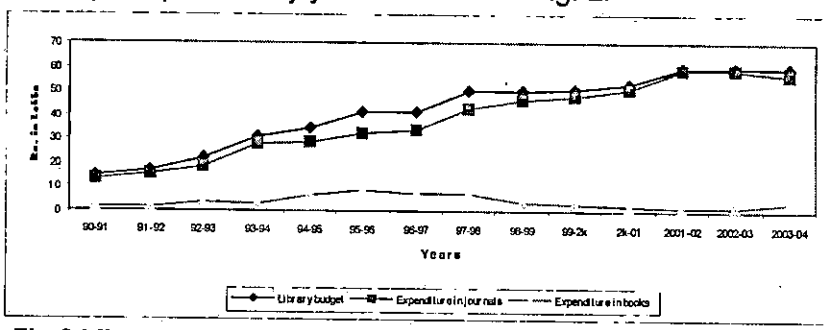


Fig.2 Library budget vs. expenditure in journals and books during 1990-91 to 2003-04

Recently, the library has also signed agreement with the consortium for maintaining following existing print journal subscription to some more important publishers as shown in table 3.

Table 3 Publisher wise lists of journals agreed to be continued subscription in printed form till 2006

ROYAL SOC CHEM,UK	ORGANIC & BIOMOL CHEM	Rs.168563
	CHEM COMM	80991
	DELTON TRANS	128113
AMER CHEM SOC, USA	ANALYTICAL CHEM	64825
	CHEMICAL ENGG NEWS	13130

	CHEM REV	44769
	I&EC RESEARCH	78552
	J AM CHEM SOC	147894
	J CHEM ENGG DATA	40210
	ORG PROC RES DEVELOP	35904
	J NAT PROD	50000
	J ORG CHEM	100480
	ENERGY & FUELS	48097
	ORG LETT	148168
SPRINGER	PLANT CELL REPORT	80684
	J IND MICROBIOL & BIOTECH	68698
MACMILLAN	NATURE	61838

In view of the above agreements, the library became handicapped for renewing subscription to journals for the year 2005. It is because, it is observed that even with the same budget of 2003-04 the library will be able to renew subscription to only those journals for which we agreed to continue (table 2 and 3) and quite a good number of important foreign journals will face deletion. Fig. 3 shows the position clearly.

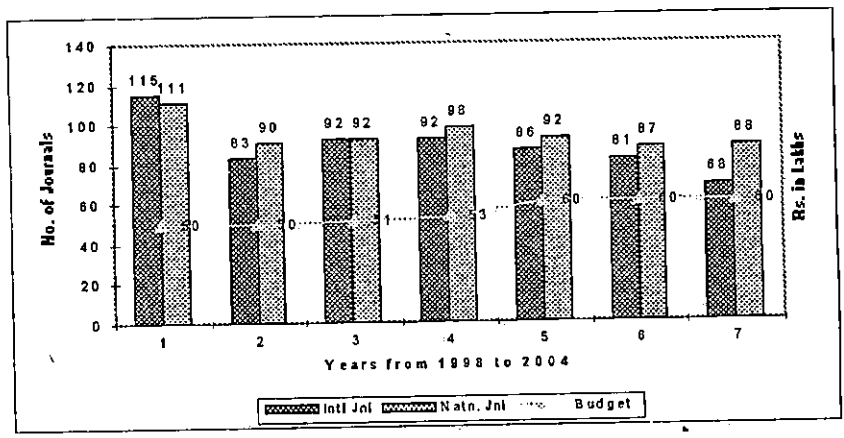


Fig. 3 Growth of budget vs. No. of National and International Journals

Since the cost of subscription to Indian journal is very less so the library is trying maintaining it at per but the number of international journal is regularly diminishing in spite of increase of library's budget. Due to this, in a multidisciplinary Laboratory like RRL, Jorhat some R&D areas like paper technology, applied civil

engineering, geo-science, etc where there is dearth of electronic journal will face problem.

Being a member of the consortium it is also getting e-journal access published by M/S Cambridge University Press and M/S Bentham Inc although RRL Jorhat library do not subscribe to any printed journal from these two publishers. The consortium is negotiating with some other important S&T publishers and it can be expected that it will succeed in providing access to 4500 electronic journals to S&T community of CSIR soon. This will be surely a very good step as our reader will be getting access to many more journals.

3. CONCLUSION

Therefore, there is a need for a proper guideline for selecting materials for library, which provides direction as to the composition of a theory of collection development through a synthesis of literature and analysis of empirical data. It will support establishing such a theory capable of guiding librarians as they direct their organizations to meet people's information needs. The phenomena like geographical location of the library, availability of a dependable on line network, systems for maintenance of hardware and software facility used quickly to keep the (Mean Time Between Failure) MTBF at lowest possible level, etc should get priority while deciding to switch-over to an on-line system completely. The E-journal consortium should ascertain supply of archival CD-ROM disc to the participating libraries for all the e-journals made available on-line now for future use. The need for a system for allowing libraries to select e-journal according to the needs of the users in stead of compelling to accept what is offered by the individual publisher. Further, the process of growth of the library's budget should be continued, as usefulness of printed form cannot be questioned.

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KNOWLEDGE ORGANISATION MANAGEMENT IN LEATHER SCIENCE ABSTRACT (LESA) AND INDEXING SERVICES IN CLRI FOR INFORMATION ACCESS IN LEATHER AND ALLIED FIELDS IN DIGITAL ENVIRONMENT: A CITATION STUDY APPROACH IN LEATHER INDUSTRIAL DEVELOPMENT

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ABSTRACT

The present study is related to the analysis of 1575 citations in view of information **use** and **information seeking pattern** approaches/access in LESA Database in digital environment by the leather information user community in relation to their subject search by means of the citation pattern approaches as by subject - wise pattern, document type – wise pattern, periodical type – wise pattern, authorship – wise pattern and geographical – wise pattern appeared/ published in LESA in leather and allied fields pertaining to volume 23, January – December issues, 1990 and volume 24, January – December issues, 1991. The data were collected and classified according to the paper theme study. "Knowledge organization management in Leather Science Abstract (LESA) and indexing services in CLRI for information access in leather and allied fields in digital environment: a citation study approach in leather industrial development" and analysed and conclusions are drawn based on the study to reveal the research trends/ results in Leather Science and Technology **(LEAST)** innovations in leather and allied fields to support the R&D community in CLRI for leather industrial growth and development

1. INTRODUCTION

The digital information management is playing vital and viable role in Leather Science Abstract and Indexing (LESA) monthly, International Periodical information and documentation publication services in Central Leather Research Institute (CLRI) for information access facilities to the leather information user community in leather and allied subjects such as Raw hides and skins, proteins and collagen, pre-tanning, post-tanning, leather chemicals and leather auxiliaries etc. in Leather Science and Technology innovations for leather and allied industrial development. The CDS/ISIS for windows software tool is being used for information access from LESA database services for R & D support and academic career development in CLRI and to enhance the Total Quality Management (TQM) for effective information handling in leather and allied subjects in the leather World scenario for socio-economic development in leather industry.

2. OBJECTIVES

This paper has been designed and developed with the following objectives:

(i) Identifying the vital role of information and documentation management in Leather Science Abstract (LESA) and indexing services in Central Leather Research Institute.

(ii) Identifying subject wise dissemination of contributions/ records in LESA periodical publication

(iii) Identifying the rank list of contributing leather subjects in LESA.

(iv) Distribution of Patent and specification types of contributions in LESA.

(v) Periodical-wise distribution of records in LESA.

(vi) Identifying the rank list of periodicals

(vii) Identifying the authorship pattern citations in LESA

(viii) Identifying the Geographical-wise distribution of citations/contributions in LESA

(ix) Identifying the Information /Documentation Scientists effective role in Digital Information Management Environment Services (DIMES).

3. SCOPE OF LESA

Leather Science Abstract is a valuable reference tool for knowledge dissemination in leather and allied subjects. LESA is a monthly international abstracting and indexing Current Awareness Service (CAS) periodical publication containing the subjects such as Footwear technology, Leather chemicals and Leather economics etc appearing in about 500 scientific and technical periodicals published all over the World. The abstracts are presented under well-defined subject headings and include indexes. This current awareness service is an effective reference tool and it can be accessed for R&D support in CLRI for leather industrial development.

4. METHODOLOGY

LESA – an international abstracting and indexing periodical publication tool for leather professionals was selected as a source of this study. As a current awareness information and documentation service source in leather and allied fields, LESA database is second to none for leather professionals. The LESA database is being provided since 1968 onwards and for the present study on **citation analysis** purpose, the special emphasis was given to volume 23 (1-12), January -December., 1990 and volume 24 (1-12), January-December; 1991 to study/know the various trends in leather and allied subjects for R&D support in CLRI.

5. KNOWLEDGE ORGANISATION AND MANAGEMENT IN LESA

The Information Scientists/Documentation Officers are having vital role in content analysis and content management for **knowledge dissemination** in Leather and Allied Subjects for leather industrial growth and development in CLRI. The ***citation study analysis/ approach*** has been evolved to identify the impact of information and documentation management in Leather Science Abstract (LESA) and indexing services for effective information access facilities in leather and allied subjects from LESA based on the ***objectives*** stated in this study. The ***results*** of this study are as follows.

5.1 Subject wise distribution of contributions in LESA

Table 1 provides the subject-wise distribution of records under the study.

Table - 1 Subject – wise distribution of records in LESA

S. No.	Subject Areas	Coverage for Total No. of records n= 900+675 = 1575 (Year 1990-1991) 1990	1991	Total	Percentage (%)	Rank
	Leather Science and Technology					
1.	Leather Industry, History, Economics, Education Management.etc.	97	142	239	15.17	II
2.	Raw Hides and Skins	27	20	47	2.98	X
3.	Proteins and Collagen	21	10	31	1.96	XVI
4.	Enzymology		10	10	0.63	XX
5	Pre- tanning	29	31	60	3.80	XIII
6.	Tanning	32	40	72	4.57	VII
7.	Post – tanning	30	50	80	5.07	VI
8	Pre- tanning materials	18	11	29	1.93	XVIII
9.	Tanning – materials	21	31	52	3.30	IX
10.	Finishing materials	44	69	113	7.17	III
11.	Leather chemicals and auxiliaries	37	15	52	3.30	IX
12	Leather processing machines	14	23	37	2.34	IVX
13	Fur production	12	14	26	1.65	IXX
14	Special purpose leathers	24	22	46	2.92	XI
15	Leather properties and Quality control	44	51	95	6.03	IV
16	By- products	21	19	40	2.53	XIII

Table 1 cont.
Subject – wise distribution of records in LESA

S. No.	Subject Areas	Coverage for Total No. of records n= 900+675 = 1575 (Year 1990-1991)			Percentage (%)	Rank
		1990	1991	Total		
	Leather Science and Technology					
17	Wool technology	20	12	32	2.03	XV
18	Tannery and environmental aspects	35	50	85	5.39	V
19	Imitation leathers	15	22	37	2.34	IVX
	Leather Products					
20	Footwear	92	183	275	18.09	I
21	Footwear auxiliaries	15	32	47	2.96	X
22	Footwear tools and equipments	14	16	30	1.90	XVII
23	Lethergoods	23	19	42	2.73	XII
24	Leather goods-Fittings and accessories		08	08	0.50	XXI
			Total	**1575**	**100.00**	

It is observed from the Table1 with regard to the subject-wise citation analysis of records in LESA periodical publication indicate that out of 1575 records in LESA, 275 records (18.09 %) are from footwear, 239 records (15. 17 %) are from leather industry, history, economics, education and management etc; 113 records (7.17 %) are from finishing materials and followed by other subjects stated in the above table. The contributions are more in ***footwear materials*** as indicated in the table.1 and stand at number one in ranking.

5.2 Distribution of documents/ citations from articles and other sources in LESA

Table 2 presents the distribution of citations in LESA periodical publication

Table - 2 Distribution of documents/ citations from articles and other sources in LESA

S. No.	Document types	Citations Coverage for Total No. of records n 900+ 675 = 1575			Percentage	Rank
		1990	1991	Total		
1.	Articles	748	527	1275	80.96	I
2.	Patents and specifications	62	66	128	8.12	III
3.	Conference proceedings	90	82	172	10.92	II
	Total				**100.00**	

It is clear from the table.2 that nearly 81% of records/citations in LESA are from articles and followed by 8.12 % from standards/patents and specifications and 10.92% are from conference proceedings sources. The contributions are more from periodical sources on articles as indicated in the above table and stand at number one in ranking

5.3 Periodical – wise distribution of records in LESA

The periodical wise distributions of records in LESA are seen from table-3 under the study.

Table- 3 Periodical – wise distribution of contributions/ records in LESA

Sl. No.	Name of the Periodicals	Coverage for n= 900+ 575=1575 records			Percentage (%)	Rank
		1990	1991	Total		
1	AQEIC BOI Tecn (Spanish)	15	20	35	2.22	XV
2	World Leather	15	26	41	2.60	XIII

3	Canadian Footwear	05	05	10	0.63	XXX
4	Leathers	15	27	42	2.66	XI
5	Leather	54	58	112	7.11	II
6	Leather Asia	16	22	38	2.41	IVX
7	Yojana	04	03	07	0.44	XXXI
8	Adhasion (German)	05	12	17	1.07	XXIV
9	Leder Schuhe Leder Waren	25	38	63	2.47	IVX
10	Leather Manufacturing	14	16	30	1.90	XVIII
11	Leder Haute Market	11	22	33	2.09	XVI
12	Leder (German)	19	28	47	2.98	IX
13	Cuoio Pelli Mater. Concian	16	20	36	2.28	IVX
14	Chemical Weekly	04	06	10	0.63	XXX
15	Dyes Pigments	03	04	07	0.44	XXXII
16	Leather Age	14	20	34	2.15	XVI
17	Bores Cipotech (Hungarian)	04	20	24	1.52	XX
18	Journal of Indian Leather Technological Association-JILTA	18	33	51	3.23	VIII
19	Journal of Soc. Leather Technological Chemistry-JSLTC	25	31	56	3.55	VII
20	Koza I Obuca (Serbocration)	24	37	61	3.87	V
21	Kozarstvi (Czechoslovia)	41	78	119	7.55	I
22	Colorage	04	12	16	1.01	XXV
23.	Journal of American Leather Chemistry Association-JALCA	21	52	73	4.63	IV
24	Leather Ware	12	17	29	1.84	XVIII
25	Indian Journal Environmental Protection	05	02	09	0.57	XXXI
26	Indian Leather	12	17	29	1.84	XVIII
27	Ind Usoara : Textile	03	02	05	0.3	XXXII
28	Ind Usoara : Pielarie	50	51	101	6.41	III

29	BSI News	06	02	08	0.5	XXXV
30	Przegl Skorza (Polish)	25	31	56	3.55	VII
31	Hikaku Kagaka (Japanese)	10	02	12	0.76	XXVIII
32	Referat Zhur (Russian)	03	01	04	0.25	XXXIV
33	Ind. Du. Cuir (French)	17	21	38	2.41	XV
34	Shuh Tech. Int	21	23	44	2.79	X
35	Leather Market.	12	08	20	1.26	XXII
36	Leather Craftsman	11	11	22	1.39	XXI
37	Polish Patent (Polish)	04	02	06	0.38	XXXIII
38	Koz. Obuvn. Prom. (Russian)	19	21	40	2.53	XIII
39	World Footwear	06	05	11	0.69	XXIX
40	Voice	11	07	18	1.14	XXIII
41	Standard India	03	01	04	0.25	XXXIV
42	Shoe Leather News	07	06	11	0.69	XXIX
43	Grasas Aceits (Egyptian)	02	01	03	0.19	XXXX
44	Standard World over Monthly Addition	21	17	28	1.77	IXX
45	Tanners Get – Together TGT/ Leather Research Industrial Get – Together – LERIG	31	27	58	3.68	VI
46	American Shoe Making	07	06	13	0.82	XXVII
47	Pakistan Leather Trade	07	07	14	0.88	XXVI
48	American Dyest Report	03	01	04	0.25	XXXIV
49	Gaz. of India	03	03	06	1.39	XXI

The periodical-wise analysis of the records reveals that out of 1575 records in LESA 119 records (7.55%) are from "***Kozastvi***" 112 records (7.11%) are from ***Leather*** and 101 records (6.41%) are from ***Ind. Usoara : Pielarie*** *and followed by other periodical sources stated in table 3 and the contributions are more in Kozarstvi periodical source and stand at number 1 in ranking*

5.4 Authorship pattern citations/ contributions in LESA

The Table-4 provides the authorship pattern citations in LESA

Table- 4 Authorship pattern citations periodicals in LESA

Sl. No.	Authorship pattern	Citations coverage for 1575 records			Percentage
		1990	1991	Total	
1.	One	166	260	426	27.04
2.	Two	134	190	324	20.57
3.	Three	124	170	294	18.66
4.	More than three	154	185	339	21.52
5.	Citations from periodical sources	97	95	192	12.19
	Total			**1575**	**100.00**

It is evident from the Table-4 that the majority of contributions cited in LESA periodical publications are from single authored while considerable number of contributions are resulted from co-authors. Multiple authorship is a well recognized feature in modern leather science and technology and there has been a consistent trend towards the increased collaboration pattern in leather and allied fields and about 12.19% of records are from periodical citation sources in LESA, based on data analysis, while surveying the authorship pattern views on LESA data base source. 27.04% of single contributions have been cited from various periodical sources in LESA.

5.5 Geographical-wise distribution of records/contributions in LESA periodical publication

The Table - 5 indicates the Geographical-wise distribution of records under the study

Table–5 Geographical-wise distribution of records/contributions in LESA periodical publication

Sl. No.	Name of the countries	Number of citations n=1575			Percentage
		1990	1991	Total	
1	America (USA)	105	75	180	11.42
2	Argentina	21	18	39	2.47

3	China	8	11	19	1.20
4	Czechoslovakia	64	47	111	7.04
5	England (UK)	101	72	173	10.98
6	France	23	19	42	2.66
7	Germany	94	61	155	9.84
8	India	175	108	283	11.61
9	Japan	17	19	36	2.28
10	Romania	46	27	73	4.63
11	Sweden	08	11	19	1.20
12	Spain	23	21	44	2.79
13	Pakistan	06	04	10	0.63
14	Italy	27	25	52	3.30
15	Finland	14	11	25	1.58
16	Israel	11	09	20	1.26
17	Egypt	05	03	08	0.50
18	Australia	21	19	40	2.53
19	Holland	5	03	08	0.50
20	Yugoslavia	11	08	19	1.20
21	Taiwan	15	13	28	1.77
22	Turkey	8	11	19	1.20
23	Switzerland	12	15	27	0.17
24	Russia	41	37	78	4.95
25	Hungary	31	36	67	4.25
26	Portugal	17	18	35	2.22
27	Netherlands	11	10	21	1.33

The Geographical-wise analysis of contributions reveals that out of 1575 citations in LESA, 283 records (11.61%) are from India, 180 records (11.42. %) are from USA, 173 records (10.98%) are from UK and 155 records (9.84%) are from Germany and followed by other countries as indicated in the table 5.

6. MAJOR FINDINGS

Following are some of the important findings of this study:

(i) It covers 81% of records/contributions in the LESA are from journals.

(ii) It covers 24 different major subject fields in Leather Science and Technology.

(iii) It is evident from the study that a majority of the contributions are from single authorship pattern in leather and allied fields as cited in LESA while a considerable number of items resulted from the contribution of multiple-authorship

(iv) 12% of the articles, mentioned from periodical citation sources

(v) "Kozarstvi", "Leather." and Ind. Usoar: Pielarie occupies first three ranks in the journals covered under this study.

(vi) India, USA, UK and Germany occupies first four ranks in the countries covered under this study

(vii) It is also to note that Indian contributions are more in leather and allied fields and stand at number one in ranking in the Geographical-wise distribution of contributions.

7. CONCLUSION

The leather science abstract and indexing services are having vital role in CLRI for information access and knowledge dissemination in leather and allied fields for leather industrial development. The Citation Study Approach is an imperative measure to identify the emerging trends in Leather Science and Technology innovations in leather and allied fields with access to LESA. The abstracting and indexing services of this type will enable other academic and R&D institutions to provide similar services to their respective disciplines. The quantitative study of such abstracting and indexing services would throw light on the nature of research being carried out in the area of leather and allied fields. The Citation Study will also facilitate for the identification of core journals, core authors and core countries that produce research output in the field of interest. In view of the changing scenario in the information and communication technology, it is suggested that the library and information officers shall strive for Knowledge Organisation in Digital Environment in Libraries **(KODEL)** for information management services in the present Organisation climate and culture.

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KNOWLEDGE ORGANIZATION IN DIGITAL ENVIRONMENT IN LIBRARIES

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ABSTRACT

Libraries have an important role to play in social, Cultural, Political and economic development of the country. Libraries have a Nobel mission of imparting education to the public. A modern libraries has no barriers of space, time and shape (not necessarily a book, it could be in the form of any floppy, CD-Rom, cassette, internet etc.) The technological advancement accompanied with global influence of information technology has drastically affected the routine task of the libraries. It has affected publishing, acquisition, storing and dissemination services of any library.

Information is considered the most important resource and that is why context of decision making, information is also treated as the blood of management. The World Bank report (1999) begins with the realization that economies are built not merely through the accumulation of physical and human skill, but on a foundation of information, learning and adaptation.

This article aims to give an overall picture of the knowledge organization in digital libraries in general. It aims to study the knowledge organization in the libraries and its retrieval usefulness to the user. The latest digital technologies help to transit the large quantum of data in a convenient way. The paper will be continued to or challenges and services, which are based on digital material.

PROMOTING LIBRARIES AS HUB CENTERS FOR KNOWLEDGE ORGANIZATION AND RETRIEVAL

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ABSTRACT

This paper tries to present a role model for knowledge organization in libraries. It also tries to synthesize the mechanism for knowledge organization in libraries as knowledge hub centers with the help of Information Technology agencies, end users and librarians as Information Catalyst in the whole procedure of the flow of knowledge. It emphasizes the use of standard library techniques and other standards to provide quality in the process of knowledge flow. It also emphasizes the use of Internet as access provider and networking of already present networks through Internet.

1. INTRODUCTION

The digital information has opened entirely new perspectives and made advances in knowledge possible in all fields of life. India's space agency successfully launched EDUSAT – a knowledge bank satellite - for educational services, which is expected to boost distance learning, communications, broadcasting and weather forecasting.

Any object coming in contact with any sense organs the concern organ gets stimulated and knowledge is gained. In Library Science knowledge means to refer to codified, captured and accumulated facts, methods, principles, techniques, strategies, skills, ideas, judgments, root causes, actions, focused innovations, intuitions and so on in the form of books, papers, manuals, computer code, etc.

According to Stanley Davis 'Information is about taking data and putting it into a meaningful pattern. Knowledge is the ability to use that information'.

The International Encyclopedia of Information and Library Science defines knowledge as "Knowledge in information evaluated and organized in the human mind so that it can be used purposefully".

The interpretation of information depends upon knowledge of the interpreter to analyze it according to his understanding at particular time and space and also on knowledge defined in information.

2. KNOWLEDGE GENERATION AND MANAGEMENT

'Knowledge is power' indicates knowledge management is a powerful technique requiring powerful tools to manage and retrieve it specifically at particular moment to make a decision of value. Knowledge must be shared for developing new knowledge and this is a challenge for librarian to capture tacit knowledge and make it accessible to those who require it most. Hence it converts knowledge into productive intellect and is a value adding process. Knowledge generation and management is a cyclic process as shown below.

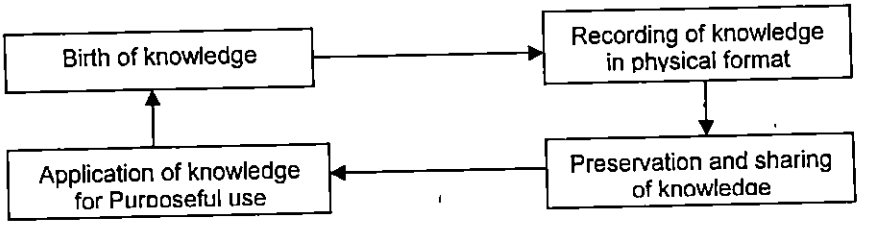


Fig. 1 Knowledge generation and management

The knowledge management is the process of producing, collecting, organizing, storing, filtering and disseminating knowledge through Information Technology (IT) networks. According to Karl, Knowledge Management can be defined as 'Art of creating value from an organization's intangible assets.' The objective of knowledge management in libraries is to promote knowledge innovation whether it is theoretical, technical or organizational innovation management. The process of transformation of data to wisdom is as shown below.

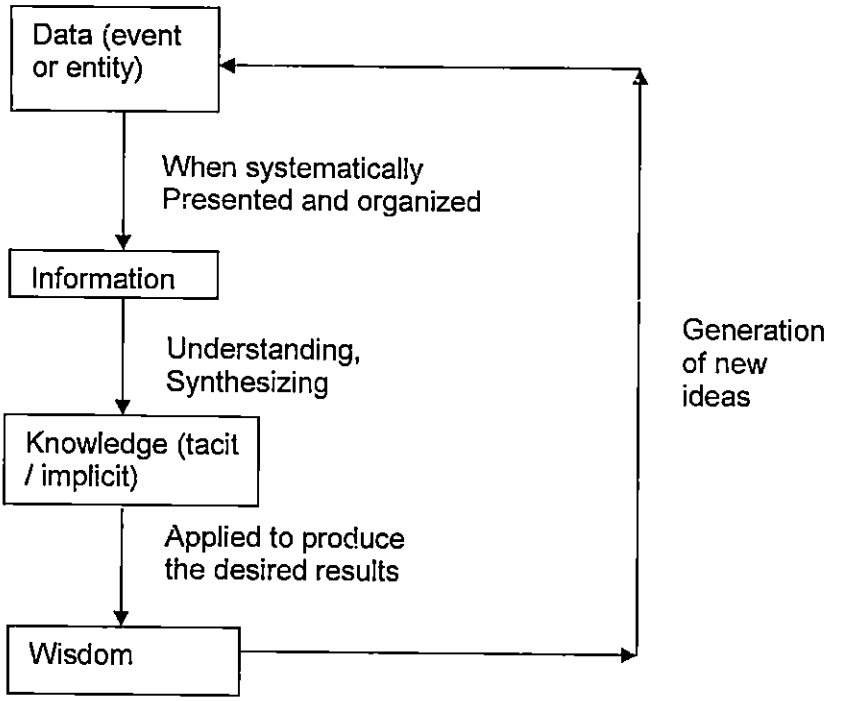


Fig. 2 Process of transformation of data to wisdom

According to APJ Abdul Kalam (2004), "Knowledge Management helps an organization to gain insight and understanding from its own experience. It also prevents intellectual assets from decay, adds to firm intelligence and provides increased flexibility. Digital library is an important component for capturing the explicit knowledge. This has to be supplemented with the implicit knowledge, which will eventually get transformed into a knowledge management system".

He also informed that there is a mission of Digital Library web portal of India piloted by the Ministry of Information Technology with Indian Institute of Science and Carnegie Mellon University as partners for fostering creativity and free access to all human knowledge. This digital library as a first step will create a free-to-read searchable collection of one million books by 2005 in India. This library was launched in 2003. Prof. N. Balakrishnan, Chief Coordinator of Digital Library of India informed that, so far 20 centers are operational throughout the country.

Since networking and IT is a global phenomenon the emphasis must be on the International Standards for information

organization and flow. The teaching of these standards and their use should be included in the curriculum. The library science has well-researched and standard techniques for accessing, preservation and dissemination of knowledge. These are-

a) For categorization or codification of knowledge in systematic order and logical divisions – Classification system (Such as DDC, UDC, Colon Classification, etc.)

b) For helpful arrangement for easy access of knowledge – Indexing, cataloguing, bibliographies, metadata. (Such as AACR, ALA, UNIMARC, ISBN, ISSN, Common Communication Format for cataloguing and ISO2709, UNISIST, ISBD i.e. International Standard Bibliographic Description, Dublin Core).

IT is necessary for knowledge management to enhance speed and reduce cost. It also enables inter-linking of knowledge sources, databanks and Internet. Librarians can create a network among themselves through Internet by connecting local area networks to global Internet and making each library as knowledge hub center as presented in Fig.3.

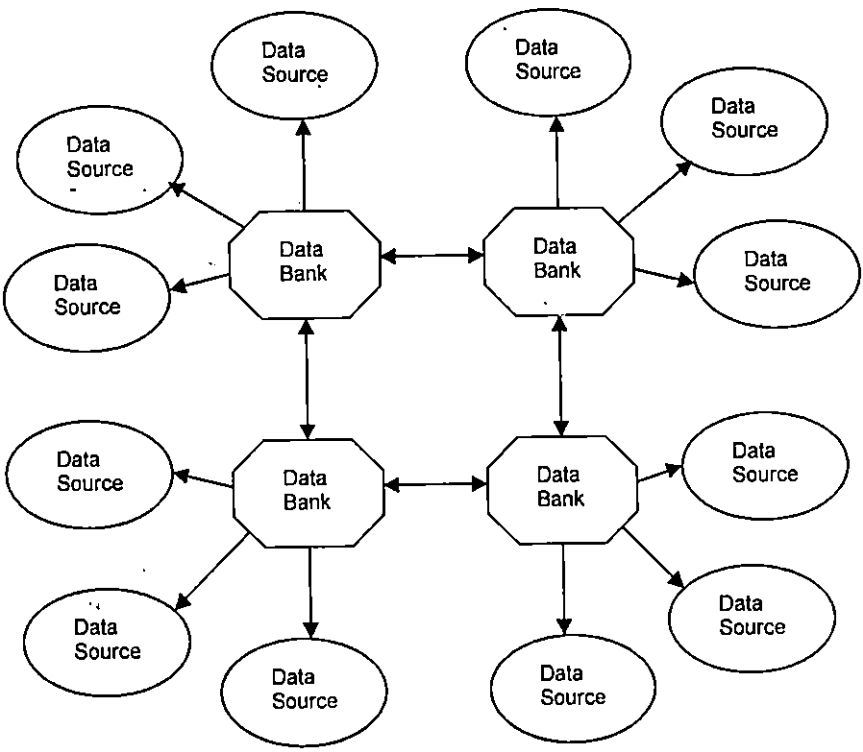


Fig. 3 Library as knowledge hub center

Since IT is very volatile area with continuously changing software developments and Internet is a time consuming and frustrating for accessing specific information as it gives lot of unwanted information, the Universal Bibliographic Control with use of the Common Communication Format is a necessity. Librarian's community must find the ways to apply the laws of library science. We must use our classification, cataloguing and indexing procedures for organizing, processing and dissemination of knowledge.

Kim H. Veltman (1999) says, "without standards in a networked environment, there will be no interoperability and the results will remain isolated. The concept of Digital Reference Rooms offer a new key to interoperability of distributed networked knowledge. This will transform the role of search engines and fundamentally change the scope of the Internet, as we now know it. Digital Reference Rooms are the traditional equivalents of search engines and structuring tools".

According to Giriraj G. Halkar & Sangita Gupta (2004) networking of digital libraries for knowledge management include Internet and extranets, storage architectures, IDBMS, metadata, data acquisition and gathering dissemination messaging, information retrieval, information resource sharing, GroupWare, mediator-ware, online analytical processing, multidimensional analysis and data mining. To be effective knowledge managers the librarians will need a good understanding of the large business environment. They have to become more like an entrepreneur rather than a customer service agent.

Till now librarians worked as catalyst or brokers of the information that is recorded in a physical media. But according to definition knowledge is also related to information within minds of people i.e. the information, which is not physical but emotional or imaginative. It is recorded virtually but not in a physically readable format. Unless and until the information is recorded in some physically readable form (it may be either fully recorded or at least citation with note) it could not be used or share. For this there is the boundary of human rights, copyright's and intellectual property rights, etc. as this is very first hand information. To get this already evaluated and organized information recorded in human mind and transform it in some physically readable format or give access to the traces of it by way of citation is a responsibility of librarians. It is also a responsibility to trace the barriers in the process and reduce them. This needs auto mechanism system to get feedback

from the end user, which will guarantee the ongoing information flow and will also be useful for improvement in the mechanism.

The Library and Information Centers should sphere the formulation of new policies, strategies and implementation of knowledge management for rendering qualitative services to its users for increasing user's faith in the organization. Dr. S.R. Ranganathan's five laws will work as ever-guiding principles for this purpose.

According to P. K. Mahapatra and B. Chakrabarti (2002) the accessing program should have facility to determine in standard way –

* The useful access points in the information source
* Structuring and arranging these access points for powerful search
* Linking of access points for multiple search
* Interlinking of access points for related material
* System that actually matches the information source against requested access points.

Donald J. Waters (2000) in his article beyond digital libraries have mentioned the breakthroughs needed in a broad range of areas, including:

- Robotic and other methods for capturing data rapidly, accurately, in large volumes, and in a variety of formats;
- Facilities for representing and traversing the multi-lingual and multi-layered semantic dimensions of those data;
- Simulation, visualization, and other tools for exploring, comparing, analyzing, and synthesizing information;
- Collaborative filtering, recommendation systems, and other innovative techniques that improve and personalize precision and recall; and
- Systems for ensuring persistence of data and software.

The syntheses of all the above information indicate certain presumptions for libraries as hub centers for knowledge organization and retrieval. These are-

(i) Knowledge of library science techniques and standards.
(ii) Know how of digitizing all type of knowledge and recording it for future access with different access points
(iii) Using web based technologies and software to access knowledge
(iv) Regular updating of databanks, metadata, software and hardware as per requirement.
(v) Use of newly emerging useful techniques, e.g. robotics, Nano-technology, etc. wherever necessary.
(vi) Knowledge is infinite and for purposeful use.
(vii) Transparency in information retrieval at all the terminals.
(viii) Training to users for accessing knowledge easily.
(ix) Requirement of total quality maintenance at all levels all the time.
(x) Recording of tacit knowledge in physically readable format.
(xi) Approval of knowledge generators to share that knowledge- intellectual property right.
(xii) Facilities of e-conferencing or messenger techniques
(xiii) Ease in handling software by librarians with or without external agencies.
(xiv) Mapping of keywords, classification numbers and information by developing strong search engine.
(xv) Besides digital source information, the information about original document should be provided for accessing the original document.
(xvi) Training program through networks for library staff and cultivating network organization culture within employees and users.

Knowledge Management require following tools –

(i) Policies and strategies for knowledge management
(ii) Internet / extranets – to access information
(iii) Digital libraries, digitization projects, Data warehouses – to store the data
(iv) Groupware – offering platform for communication between each other.

(v) Powerful Information retrieval tools – for searching knowledge

(vi) Data analyzing – i.e. classification, indexing, etc.

(vii) Electronic document management system – for managing knowledge contained documents online

(viii) Metadata – data about data –i.e. Information added to a document that makes it easier to access.

(ix) Help Desk through Internet – helping users for information retrieval and storage.

(x) Auto feedback generator – to receive feedback from user

(xi) Common authority file, Common Communication Format and Universal Bibliographic Control – for uniformity in information access

(xii) Digital Reference Room/Desk- to provide effective reference service

Fig.4 presents role model for libraries as hub center for knowledge organization and retrieval

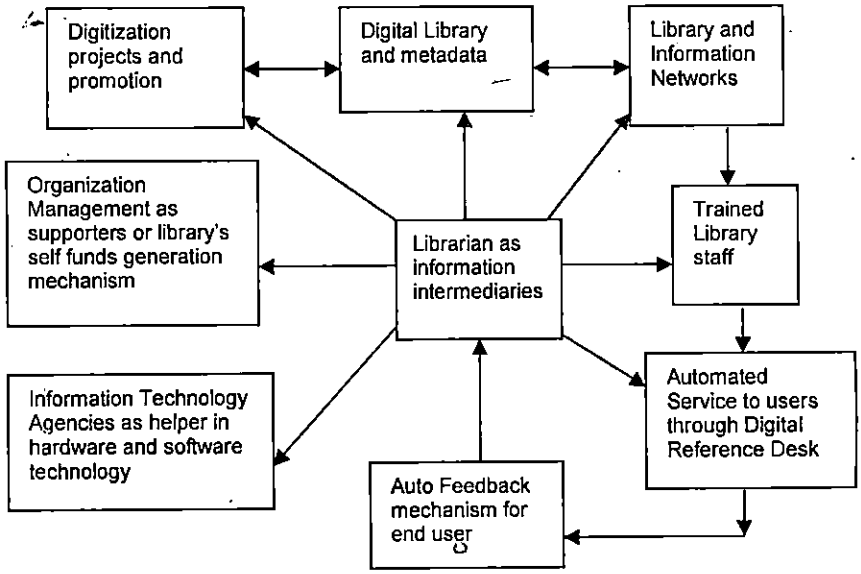


Fig.4 Role model for libraries as hub center for knowledge organization and retrieval

The above figure indicates that the Librarian is central to all the activities at knowledge hub center of his library. The Librarian needs to deal with organization management to support the hub center or find some self-fund generation scheme. The information

technology agencies will play an important role of software and hardware suppliers, maintenance and up-gradation. The Librarian will promote the digitization projects, which directly link to the digital library of which the librarian is in-charge. This digital library will be connected to Library and Information Networks. One of the roles of these networks will be to conduct workshops at various locations to train the library staff for knowledge management system. The trained library staff will provide automated service to users through Digital Reference Desk. An automated feedback mechanism will create automatic feedback from the users and direct it to the Librarian. This will be useful for further improvements.

In this role model the Librarian is intermediary between end user and information. However the major workload is divided among three categories i.e. Information Technology Agencies, Librarian and Library Staff and Users as given in the table below.

Role	IT Agencies	Librarian/ Lib. Staff	Users
Networking	Software and hardware development and maintenance	Active participation in network development and maintenance Guiding with Library standards for making the database	Ready to share information and communicate
Training	Provide training to staff to handle the software	Help staff members and users to get trained for search mechanism and recording	Learn to search, download, use Reference Desk and Help Desk
Internet	Internet based Software with library science standards	Using Standard library techniques for processing and retrieving data	Need of highly powerful search engine and filtering mechanism
Data storage/ servers	Strong data storage servers with web portals Use of artificial intelligence	Updating data very regularly. Analyzing information and adding value to it through library techniques	Issues of human rights, intellectual property rights and copyrights
Automation improvement mechanism of the organization	Regularly inform the organization about updated versions of software and hardware	Regularly update the system to facilitate knowledge sharing	Save the time of the user.

Knowledge is for use and not merely business	Agencies should be aware of this while considering the profit	Locate information gatekeepers, subject experts, eminence in specialized areas. Self leadership and self regulation	Understand the efforts behind the mechanism and motivate networking
Digital Library and digitization project	Help for its development	Promotion and maintenance of it	Learn to use digital library and handle digital material
Software package	Progressively strong software package with web based technology. Regular updating of the package with information to and from the Librarian	Train to self and the staff to use the software and communication skills and presentation techniques. Regular updating of data	Learn software package for data retrieval
Auto feedback mechanism	Integrated auto feedback mechanism within software to know who has used which information for what purpose and when	Collect feedback and updating according to the needs	Should complete feedback information
Pocket computers	Develop pocket computers with satellite based cordless internet connections to access information from anywhere	Help to develop system supporting pocket computers	Ready to purchase and carry the pocket computers
Data Retrieval Reference Desk	Development of strong search engine only for library and information networks based on internet	Supporting mechanism to this search engine. Training to self, staff and users	Knowledge of Reference Desk
Already present networks	Supporting mechanism to interconnectivity of all presently available networks through internet	Maintaining individuality of networks on the basis of subjects and yet interconnectivity of them	Access to any network through library for any subject followed by immediate document delivery and feedback
Data Mapping	Codification (Classification) of records and mapping it to	Mapping of user profile with records using Common Communication	Detail profiles of the users with up-to-date keywords search

	document with keywords and codes	Format and web based Digital Union Catalogues (Metadata)	
Capturing knowledge	Auto mechanism for capturing knowledge using GroupWare, messengers, etc. information retrieval tools, data analysis	Data warehousing or data banks to data store. Metadata to easy access of information. Knowledge hub center.	Help desk through internet for information retrieval and auto feedback mechanism
Use of other technologies e.g. robotics, space communication, Nanotechnology , etc.	Should be able to provide up-to-date information. Help to acquire the mechanism wherever needed.	Learn to tackle with the new technologies, cyber infrastructure applicable to the field of Library Science	Should be helpful in handling the situations
Research and development	Help to provide research facilities in technical fields other than library science	Actively involve in research projects. Support the development in library Science field	Positive response is necessary

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TELUGU DATABASE MANAGEMENT

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ABSTRACT

The paper presents the various problems encountered during the creation of Telugu Database. The complex nature of naming pattern of Indian authors and the problem faced thereby while rendering are discussed. Further the various constraints encountered with regards to the classification of Telugu language books are also enumerated. Through the experience of the IGM Library in the organization and creation of the database of Telugu language, the authors attempt to demonstrate a way to overcome constraints.

1. INTRODUCTION

India is a vast country with a very wide cultural and language diversity (spoken and written). There are approximately 250 languages and 800 dialects. Among them 18 are officially recognized state languages and Hindi given the National Language status and Sanskrit has been officially allotted the status of Classical Language.

In India, pressures on the one hand to learn Hindi as a National Language and on the other to maintain the local and regional "link" language both continue. This involves the issue of a balance between national integration on the one hand, while allowing for regional autonomy on the other.

Due to the revolution in the communication technology and the advancement made in the realm of science and technology there is an unprecedented growth of literature, which has resulted in information explosion. The libraries play a pivotal role in the

collection, organization and dissemination of knowledge. To meet this growing demand the libraries are using more and more Information Technology tools, techniques to provide the user precise information at the right time in the right manner within the shortest time possible.

1.1 Multi-Culturalism

Issues of mother tongue and bilingualism lead to the wider question of bicultural or multicultural education, Languages are to be taught keeping in view the multicultural nature of India. Very often religious instruction in Sanskrit, Hebrew or Urdu or Arabic may also increase the demand for bilingual education.
The success of the bilingual education depends on many factors out of which the use of relevant materials, which are meaningful to all children, is basic and imported reading material mostly is not suited to meet this criterion. Further, proper teacher training needs to be stressed if balanced bilingual programs are to be implemented. Teachers, who are fluent in more than one language, may be required to suit the linguistically diverse population profile of a country like India.

1.2 The Telugu Language And Dialects

The languages of Andhra races is generally known as the Andhra Bhasha, Telugu or Tenugu, all used synonymously, which belongs to the Andhra Dravida type.The language of Northern Circars is from an official point of view supposed to be standard form of Telugu. But dialects of telugu are preserved to this day in the aboriginal areas. The dialects are Komtau dialect spoken by Chanda population, the Kamathi dialect spoken by some artisans tribe near Bombay, the Dasara dialect of the wandering beggars of Belgaum , the Beradi dialect spoken by Beradis and the Varadi dialect of another wandering tribe of Belgaum, Bijapur, Sholapur, Akola and the native state of Jamkhandi and Ramdurg in Bombay presidency.

2. INDIC NAMES

Indic names may broadly be classified into Hindu names and Muslim names. In view of the varying practices prevailing in different linguistic areas and among cultural entities in the matter of name formation it will be convenient and practical to consider the question of Hindu names in linguistic groups. Though certain words are found to be commonly used as family names or

surnames in different areas the forms present widely different dialectical variants, which are hardly distinguishable from the root word in original Sanskrit. The given or basic names also tell the same story. "Har Diyal" and "Haradayal", "Brijbhikshen" and "Vrajabhushana" etc. "Hom" and "Som" are some of the instances, which can be multiplied.

Apart from the dialectical variants there are both the "Vernacular" and the "Westernized" forms, each of which is systematically and consistently used in works in vernacular. The problem of rendering them in an integrated catalogue or bibliography in one form is problematic. Further, the use of surname or forename, as entry word is to be determined according to the practices prevailing in different linguistic areas. A comprehensive list of words used as surname has got to be drawn up. The next question is that of variant spelling and faulty orthography being used by the authors and publishers in works in roman alphabets.

2.1 Hindu Personal Names

Very often a Hindu name is not a pure name standing or capable of standing by itself without other attached or additional words. In India, Hindus of a very early period used only the personal or proper name without an attached, individualizing word, because there was no need to individualizing them: For example: Kalidasa, Bhabhahuti, Valmiki etc. But in course of time it was found that these personal names failed to distinguish the men and women, particularly the authors. Various expedients have, therefore, been adopted in different periods and regions of India for the purpose of distinguishing one individual from another. For example, the addition of the parental, caste and occupational names to the personal name. None can be called really successful except, perhaps the Dravidian system of adding to a man's name that of his village and district or home.

Though a Hindu name consists of several parts of elements it is unfortunate that the relative succession of these parts or elements is the name is not of the same function in all parts of India. Further, the composition of a Hindu name even in a particular region has not been uniform at different periods. Added to this, the language and the dialects of different regions of India have played a large part in determining the variation in the forms of names (proper names or family names) e.g. 'Brijbhikhen' and 'Vrajabhusana' are dialectical variants of the same word considered etymologically; similarly, 'Harkissen' and 'Harakrsna'

etc. Again 'Home' and 'Shome' (Som) are regarded as two distinct surnames, though the former is a dialectical variant of the later, which is a correct Sanskrit form.

Thus, in determining the question of entry element of a Hindu authors name the 'period', the 'region'. The language or dialect' are to be taken into consideration. In Telugu and Malayalam, the personal name including the caste name is usually preceded by only one word, which is the house-name, (Family name) e.g. Malayalam: Chettur Sankaran Nair (to be rendered as Sankaran Nair, Chettur). Some times, the personal name and the caste name are contracted into initials; while the House-name is written in full e.g. G.K.Chettur (to be rendered as Chettur, G.K.). Telugu: Sarvepalli Radhakrishnan (to be rendered as Radhakrishnan, Sarvepalli).

3. INDIAN LANGUAGE BOOKS

The vagaries in the formation of Indic names in various parts of India is a very recognized fact and the absence of a standard guide to Indic names causes a lot of problems to librarians. So far as rules of entry are concerned Dr. S. R. Ranganathan, the doyen of Indian Librarianship, has given much thought to this and his Classified Catalogue Code is pioneering attempt at a code for Subject Cataloguing. His Chain Indexing procedure will go a long way in solving the problem of establishing specific subject headings in Indic languages in the case of a dictionary Catalogue for publication in Indian languages. But Dr. Ranganathan has neglected Descriptive Cataloguing altogether. The Indian Standard Institution (renamed as Bureau of Indian Standards) indicates that it is one of the vagaries prevailing in the Indian Publishing World, where a standard style manual is absolutely necessary.

Rudolph Gjelsness in his Research in Cataloguing and Classification (In Library Trends, October, 1957, p.175-176) observes in connection with the cataloguing of materials in Non-European languages in Western Countries. "The Special committee on Cataloguing Oriental Materials, established by the A.L.A. Division of Cataloguing and Classification in 1954 (G. Raymond Nunn, Chairman) has worked with the Library of congress and other Libraries having the Far Eastern collections, on amendment to A.L.A. cataloguing rules, which would standardize cataloguing practices for Chinese, Japanese and Korean publications. The resulting decisions will permit the

production of cards for these materials, which can be incorporated into the catalogue of all the libraries involved. This committee expects to extend its investigation also to subject heading and classification".

Recent interests in the literature of south East Asia on the part of Western bibliographers and cataloguers has led to certain revisions in the existing cataloguing codes so far as publications in the languages of South East Asian are concerned. The Library of congress, Washington D.C. has proposed to delete Rule 70, Indic names and to substitute certain other revised rules approved by the committee on Descriptive Cataloguing of American Library Association's Division of Cataloguing and Classification and the Library Congress.

3.1 Processing

The technical processing of books in Indian languages, especially with regard to literature and languages is a bit problematic. Even a widely used Classification Scheme like DDC itself has relegated Indian Languages and its literature under "Other Languages", "Literatures of Other Languages" under the class number 490 and 890 respectively and its subdivisions. The Indian languages have to share this small portion with African, Asian etc. Further, among the Indian Languages themselves, the languages belonging to the Indo-Aryan and Dravidian group have been squeezed into a small slot.

3.2 Classificaion

Thus when a class number for a book in an Indian language fiction or a dictionary is being synthesized, it involves more time and efforts on part of the classification expert to analyze and assign appropriate number. Further, it will also be too long and cause problems in writing the number on the spine of the book as well as shelving. Brevity is, thus the first casually of the existing system of classification as far as language publications are concerned.

3.3 Keywords

Unlike the English language publications, no standardized Subject headings/Key words system is yet available for Indian Languages (such as Library of congress, Sears List of Subject Headings etc.). In the case of automated software system, the Keywords have to

be entered in roman script. So the precision during data entry retrieval process suffers.

3.4 Cataloguing

The cataloguing requires the adaptation of the bibliographic entries in the Dravidian script to a standard cataloguing code system. Preparation of the cards is a laborious process, as they are to be manually prepared, unless of course, a separate typewriter for each language is available. Again the typewriters are not available for all Indian languages.

3.5 Shelving

Further, since the class number normally is very long, shelving of the language and literature books cause confusion. In the case of other subjects (social Sciences, Sciences, Arts and Humanities) shelving become even more complicated as the language of the book is other than the English.

4. AUTOMATION OF INDIAN LANGUAGE BOOKS

In an automated environment processing and building of a database of existing and current books in Indian Languages involves much more planning and efforts as most of the library application software by default is in roman script i.e. English Language. Therefore, In-house or commercial software has to be installed to process each language. Alternatively the transliteration method has to be used to enter the bibliographical details in the system. So, while initiating the automation process of language books prior policy planning and decision regarding which methodology to be adapted for the conversion of existing database as well as the current cataloguing, classification system is a must.

4.1 Constraints Encountered During Database Building – Indian Languages

(i) Non-availability of standardized spelling for Indian Languages.

(ii) Non-availability of standardized code for generation of subject headings/key words in case of Indian Languages like the Library of congress subject headings, Sears List of Subject Headings.

(iii) Non-availability of standardized Subject-Indexing provisions for Indian Languages.

(iv) Problems of data input for Indian script as all the software and the keyboards are by default in roman script.

(v) The Library Application software of Indian Languages are still in development stage.

(vi) Bi-directional script problems: Arabic, Hebrew and Urdu are written from right to left, whereas default direction of any standard code such as MARC, UNIMARC etc. is left to right. This problem gets reflected in the Application Software also.

(vii) Sorting of multi-script data is still an unresolved issue. The software's automatic indexing systems are by default for roman script. Hence, availability of Indian language records (especially, Telugu language records) in OPAC becomes a problem.

(viii) Users encounter difficulty in accessing/retrieving data regarding Indian languages due to lack of precision in data input.

5. LIBRARY APPLICATION SOFTWARE AND MULTILINGUAL SUPPORT

5.1 LIBSYS

Earlier version of Libsys did not have multilingual support, so transliteration method had to be used to enter bibliographical details of the language books. According to recent report, the latest version of Libsys is Unicode based therefore it provides multilingual support.

5.2 Virginia Tech Library System (VTLS)

Unicode: **Virtua was designed with multilingual support in mind in VTLS**. Unicode can be incorporated as one of the most fundamental elements for library systems operating in a global environment. All records are sorted in the Unicode encoding scheme. It supports and allows the entry of any of the combination of character at any point of time in the system even configuration of any script in a single field. Conceivably, most pertinent to the library the Virtua system is the only system that supports Unicode throughout every subsystem.

5.2.1 The Adaptations

5.2.1.1 Potti Sreeramulu Telugu University, Hyderabad

The university has three campuses at Hyderabad, Srisailam and Rajhamundry and one more at Warangal. The Library has approximately 1.5 lakhs collection. It has about 60 journals in Telugu language.

- **Processing of books:** Automation work is in progress. The library flows 18th edition of DDC for classification of books and Cutters tables are being used for assigning book numbers. AACR II rules are being followed for cataloguing Telugu books. All the entries are arranged in single sequence i.e. the dictionary Catalogue. The Telugu collection is arranged in a separate sequence from 000-999 classes.

5.2.1.2 Osmania University Library, Hyderabad

It has collection of about 5.0 lakhs. The House keeping operations are yet to be automated. It subscribes to various journals in Indian languages apart from English.

Processing the Telugu collection: Books are being classified using the modified classification scheme of DDC published by Central Institute of Indian Languages, Mysore for literature class as in IGM Library. And Cutters table are being used for Book number. AACR is being used for book cataloguing. The Dictionary Catalogue is being used for arranging the entries.

The Telugu collection is arranged in a separate sequence from 000-999 classes.

6 COLLECTION MANAGEMENT OF TELUGU BOOKS AT IGM LIBRARY, UNIVERSITY OF HYDERABAD: A CASE STUDY

The collection development of Telugu books commenced along with the general books in English language as well as in other Indian languages. The library has about 26,000 Telugu books out of total collection of 2,90,000 volumes. The books belonging to Telugu language are purchased based on the recommendations of the Telugu Department as per the purchase policy of the IGM Library by the Library committee.

6.1 The Cataloguing

The cataloguing was being done manually until automation was initiated. In the absence of the availability of any standard catalogue code for Indian languages. The AACR 2 code was adopted. The bibliographical details of the Telugu language books were written in Telugu script in various fields similar to the English language books. The various entries for each book i.e. Main (Author) entry and other added entries were all hand written, which involves a lot of time and the sorting and filing were also a very cumbersome process. Only the staff with Telugu language expertise was able to handle the work, which meant that the library had to have a person with the knowledge of library science and Telugu language.

6.2 The Classification

The IGM Library uses the 18th edition to classify the books and the Cutter's Number for assigning Book Numbers. The Classification of Telugu books has two-pronged problems, one is concerned with the language and literature, the other is concerned with the books of all other subjects. The Telugu language belongs to Dravidian group. The number allotted in the DDC classification Scheme for Telugu language and its literature are 494.827 and 894.827 respectively, and there is no scope for accommodating dialects or any other aspect as is possible in the case of western languages.

6.2.1 The Adaptation

To overcome such constraints the IGM Library decided to adapt the system designed by the CIIL, Mysore called "Classification for Linguistics and languages: a modified approach based on Decimal Classification" (Mysore, 1973) with suitable modifications in the case of literature class.

The literature class: The number for main literature class has been taken as base number with appropriate alphabet index as an affix to individualize the books in concerned Indian languages. The subdivisions are also adapted to construct for various aspects like form number, dictionary number etc.

Example

	English literature	Telugu literature
Poetry	821	T81
Drama	822	T82
Fiction	823	T83
Criticism poetry	821D	T81D

Books belonging to all other subjects and language: The classification number for books written in telugu language belonging to all other subjects (Sciences, social Sciences, Arts etc.) and telugu linguistics are same as that of books written in English language (roman script) but the individualizing alphabet affix of the concerned language is used to indicate the language of the book.

Example

	English script	Telugu script
Political Science	320	T320
Physics	530	T530
Music	780	T780

6.3 Subject Headings/ Key Words

Standard subject headings/ key words are not available as yet for Telugu language script. To over come this problem the library provides the key words in English Language itself (*and not transliterated),* similar to the system followed when key words are assigned in the case of books in English language.

6.4 The Book Number

The Book number is given based on cutter's table as follows:

Narayana Reddy, C	N16 is the Book Number
Virendranath, Yandamuri	V51 is the Book Number

6.5 The Shelf Arrangement

The books in Telugu language are shelved as a separate collection. The Shelf organization and arrangement in each shelf is similar to the English language (Roman Script) books. The books are organized following the DDC class number order (i.e., - 000-999) with books shelved from left to right in each rack. Since the books are kept as a separate collection, the 'T' alphabet affix individualizing the Telugu books is ignored during the shelving.

7 CONCLUSION

The introduction of automation has helped the IGM Library in quickly processing of the records of books and other reading materials, which includes the various language books. The creation of bibliographic database eliminates manual work like card writing generation of added entries, filing cards in the catalogue cabinet. The OPAC facility helps in searching the database for specific and required particulars. The IGM Library is now planning to digitize selected core collection, which will include the Indian language books too. It is hoped that the method adopted by IGM Library will be useful to other libraries faced with the problem of managing their Telugu collection.

To overcome most of the problems connected with the management of Indian language database, suitable classification scheme and cataloguing system, which are amenable to easy synthesis and shelving, is required to be adapted. There is a dire necessity to develop suitable Application Software designed for Indian language database creation and maintenance.

Many of the educational institutions in India emphasize the study and research in the regional language and literature. There are a number of institutions, which are exclusively concerned with one or many Indian Languages, its rich literature, folklore and culture, history etc. Therefore, there is a need for the proper organization, dissemination of information regarding the library and holdings of such institutions. This information has to be available to the users in the language of their choice, at the time and place of their choice. Thus, the need is for a creation of a database of the Indian languages and the appropriate access systems to be created systematically.

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INFORMATION SEEKING BEHAVIOUR MODELS IN DIGITAL ENVIRONMENT

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ABSTRACT

The study points out a methodological approach for studying web information seeking model and use. The paper focuses to investigate academic research oriented web user's needs and their patterns of seeking information. The structure, practices, and adaptiveness of user information seeking behaviours in the context of WWW are discussed. Typically, this involves understanding of the various models of information seeking behaviour. The paper emphasises mainly on information needs based web design on a larger timescale of structure of databases, bibliometric analysis and human adaptiveness. It has discussed Internet architecture, search and retrieval strategies. Directions for future studies on this topic are indicated.

1. BACKGROUND

Apart from information retrieval there is virtually no other area of information science that has occasioned as much research effort and writing as user.'studies' for the development of any system or for modifications to be made in it, some feed back is required. This is possible only with the help of user studies. So also, in the case of library and information system, user studies have gained their importance. For the assessment of quality and quantity of the services and their utility, user studies have become the main

ingredients of the system. The psychology of the users, the behavior in gathering information, information needs of the users, the utility of various information resources, analysis of the services based on the users' needs, are among the various concepts covered in user studies.

User studies are being conducted on the behaviour of the user in seeking information, instead of the needs of the user. These studies are more useful to study the user, his/her psychology, the working conditions, the impact of his/her position in society etc. With this, the user group is studied in a better way to modify the services and tools of the information system. According to Wilson (1981), "Information seeking behaviour resuits from the recognition of some need, perceived by the user". That behaviour may take several forms; the user may make demands from formal systems that are customarily defined as information systems, such as libraries, on-line services, information centres; or systems which may perform information functions in addition to a primary, non-information functions such as estate agents, offices or car sales agencies that give current information of their field viz., prices and models etc. The user also seeks information from other people, which is otherwise called "information exchange". According to him 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. In the process, failure may be experienced with system as well as when the user seeking information from others. Use of information according to him is evaluation to discover its relationship to the user's need.

The study of information seeking behaviour can stand on its own as an area of applied research where the motive for the investigation is pragmatically related to system design and development. A different motivation is involved if we wish to understand why the information seeker behaves as he does. This is an area of basic research and although the resulting knowledge may have practical applications, there is no necessity that it should.

2. INFORMATION NEEDS

Information need arises when user perceives gaps in their state of knowledge and ability to make sense of experience. Information needs can be categorized into three dimensions such as cognitive, affective and situational.

2.1. Cognitive

Information needs as knowledge gaps that are experienced when an individual's life situation interacts with his/her knowledge or cognitive structures and reveals a deficiency in understanding. Allen (1996) suggested three categories of information needs are based on knowledge gaps, such as: Information needs arising from failure of perception; Information needs associated with exploring a topic area so as to identify alternative courses of action; Information needs that arise from choosing between alternative courses of action.

2.2. Affective

The second dimensions of cognitive needs are draped in affective responses so that they are as much felt as they are thought about. When sense has run out, the lack of understanding creates a state of uncertainty. Kuhlthau (1993) explained the uncertainty causes a number of affective symptoms, including anxiety, apprehension, confusion, frustration, and lack of confidence. These affective states motivate and direct the individual's information seeking and information use experience. Affective responses influence and are influenced by the individual's ability to construct meaning, focus information needs manage moods and expectations, and deepen personal interest in the search.

2.3. Situational

Information needs arise from the problems, uncertainties and ambiguities encountered in specific situations and experiences. Such situations and experiences are the composite of a large number of elements that relate not just to subject matter, but also to situational factors such as goal clarity and consensus, magnitude of risk amount of control, professional and social norms, and time and resource constraints and so on. Information needs would vary according to the complexity of the situation in which the information is to be utilized. Situational complexity increases when many actors and entities are involved and when these agents interconnect and interact in complicated and unpredictable ways. A specific instance of situational complexity is perceived environmental uncertainty, a variable that represents the external environments perceived complexity and changeability. Perceived environmental uncertainty is conceptualized as lack of information about environmental factors;

lack of knowledge about the outcome of an action and inability to assess how environmental factors affect success of failure.

3. INFORMATION SEEKING

Information seeking is the process in which they purposefully search for information by identifying selecting and interacting with sources. Users may rely on their own memory or intuition to fill the information need. They may also suppress their information needs or avoid a problem situation so that no information seeking is necessary. Users are frequently engaged themselves in information avoidance. They interact with their environment by limiting their intake of information if it is associated with negative outcomes, and taking information shortcuts. When information seeking does occur, it is purposive and goal directed and resembles a problem solving or decision-making process. The individual user identifies possible sources, differentiates and chooses a few sources, locaters or makes contact with them and interacts with the source in order to obtain the desired information. The information seeking behavior dimensions can be categorized as cognitive, affective and situational.

3.1. Cognitive Information Seeking Behavior

At the cognitive level of information seeking behavior, the user would select a source that is perceived to have the greater probability of providing information that will be relevant and useful. Moreover, the individual would be concerned with the accuracy and reliability of the source.

3.2. Affective Information Seeking Behavior

At the affective level of information seeking behavior, the user's degree of personal motivation and interested in the problem or topic would determine the amount of energy that he or she invests in information seeking. The information search progress, initial feelings of uncertainty and anxiety fall as confidence rises. If a clear theme is developed to focus the search, the individual may become more highly motivated and if the search proceeds well, there is a growing feeling of satisfaction and accomplishment.

3.3 Situational Information Seeking Behavior

At the situational level, the selection and use of sources is influenced by the amount of time and effort that is required to

locate or contact the source, and to interact with the source of extract information. These source attributes may be bundled together in variable called perceived source accessibility. The accessibility is influenced by experience with the source. However, when the users consider whether to accept or reject ideas from sources as tentative solutions to their problems; the dominant factor becomes the technical quality of the sources rather than accessibility. The user uses sources in proportion to accessibility, but they accept ideas from these sources in proportion to technical quality.

4. MODELS OF INFORMATION SEEKING ON THE INTERNET

Internet is an IT infrastructure for knowledge work and the need for system design to adopt on information behavioural/ approach to intranet design. Recently there have been several efforts to model information seeking on the web. This paper presents the models of information seeking on the Internet from specific areas of research such as information foraging, bibliometrics, and user browsing.

The foraging models can serve as a general background against which to organize observations about individual behaviour. For example how animals evolve different methods of gathering and hunting for food to increase their intake of nutrition, human also adopt different strategies of seeking information to increase their intake of knowledge. So, foraging for information on the Internet/Intranet and foraging for food share common features. Information foraging refers to activities associated with assessing, seeking and handling information sources, particularly in networked environment. Such search can be adaptive to the extent that it makes optimal use of knowledge about expected information value and expected cost of accessing and extracting that relevant information.

To develop a better understanding of information seeking in practice, the attributes of authorship, publication and their influences on each other are worth examining. Bibliometrics a quantitative method for the study of literature offers good insights originally derived from published information, bibliometrics is particularly applicable to studying how web documents, web sites and web users are all related through reference and use. Bibliometrics stems from the idea that distribution and use of information has patterns that can be analysed by counting and

analysing citations finding relationships between these references based on frequency, and using other statistical measures. Common sources of standard, publication bibliometrics data for e.g. on-line databases are Science Citation Index, Social Science Citation Index, where an authors' publication influence can be seen by how often the author is referenced. The following models can be used for bibliometrics analysis viz., Bibliometrics of use, Bibliometrics coupling, Co-citation analysis, Bibliometrics laws, and Bibliometrics and web documents, Webometrics (Bibliometrics and the web), Bibliometrics Measure of Group Web Use.

The information foraging and bibliometrics models of information seeking are promising approaches in their ability to reveal global, historic patterns of use, suggest alternative metrics of information value, and provide implications for system design. However, models are also needed that focus the information behaviour of individuals, as they traverse the web, taking into account the content in which this information seeking is situated, such as addressing the situation as to why the information was needed and how the information was used. The following models focus on the behaviour of information seeking. Viz.,

4.1 Marchionini's Electronic Browsing Model

The influence of new technologies, notably the WWW with its search engines and navigational links, is changing what scholars mean when referring to information seeking. He contends that, "the term information seeking is preferred to information retrieval because it is more human oriented and open ended" Marchionini (1995). The WWW provides opportunities for both information retrieval and browsing. With the proliferation of search engines and graphical browsers, the entire range of information seeking activities is possible on the web.

Marchionini (1995) proposes a model of information seeking process, turned perhaps to electronic environments. In his model, the information seeking process is composed of eight sub processes, which develop in parallel viz., Recognize and accept information problem; Define and understand the problem; Choose a search system; Formulate a query; Execute search; Examine results; Extract information; Reflect/iterate/stop.

4.2 Ellis Model of information Seeking

David Ellis (1989), Ellis (1993) and Ellis and Haugan (1997) proposes and elaborates a general model of information seeking behaviours based on the studies of information seeking patterns of different kinds of users. His model describes activities as generic: Starting, Chaining, Browsing, Differentiating, Monitoring, Extracting.

Ellis thought that hypertext based systems would have the capabilities to implement his models. If we visualize the WWW as a hyper linked information system distributed over numerous networks, most of the information seeking behaviour categories in Ellis model are already being supported by capabilities available in common web browser software. Thus, an individual user could begin surfing the web from one of few favourite starting or sites (starting); flow hyper textual links to related information resources in both backward and forward linking directions (Chaining); scan the web pages of the sources selected (Browsing); bookmark is the useful source for future reference and visits (Differentiating); subscribe to e-mail based services that alert the user of new information or developments (Monitoring) and search a particular source or site for all information on that site on a particular topic (Extracting).

4.3 Koganurmath's Models of Information Seeking

Koganurmath (1994) has designed information seeking models in his research such as: Initialisation and Analysing information, Connecting and Synthesizing Information, Potentiality and Arranging Information, Quality and filtering information, Awareness and updating Information, Pinpointed and Focusing Information.

4.3.1 Initialization and Analysing information

It means the major strategies emerged in the described activity of users with regard to the starting process involve primarily application problems, and people contacting for the provision of starting references. An alternative approach of seeking information for initialisation, excluding personal consultation, involves carrying out a literature search. This is achieved by use of computer databases and abstracting and indexing services. The aim of the literature search is to obtain abstracts of papers to browse these abstracts and retrieve papers of relevance.

The utilization of personal contact as a starting point as an approach to a new topic is a common finding in the literature detailing investigations of information seeking behaviour. It stresses that the use of interpersonal communication is a preferred source as a starting point for a pattern of external source consultation. When an individuals turn to external contact they strongly prefer human (face to face) contact. The importance of the interpersonal, information channel of seeking information and communication has already been documented among scientists and engineers and social.scientists.

4.3.2 Connecting and Synthesizing Information

This category seeks to identify the activities engaged in follow up of the references cited in materials, consulted or seeking citation to know and link between materials. Connecting involves following up citations from one source to another. It is synthesizing the information sources. There are two forms of connecting: Backward connecting: following up the references from the material consulted. Forward connecting: finding citations to know relevant work. Connecting citations involves a degree of subjectivity. Relevance is the overriding criterion expressed by the respondents for following up references to materials. The users for making citations gave several reasons. Citations, usually of reviews or seminar papers, were made to provide background information. Other reason for citations included, when using details from previous work, e.g. methodology or conclusions; placing the work in the context of previous work. The focus of interest here is not with citation practices, as such, but with characteristics of pattern of searching for information, which involves citations between materials. Connecting is synthesizing the required information. Backward connecting as an activity for following up references cited in material consulted was a technique employed by all the respondents surveyed. Forward connecting was a strategy engaged by almost 60% of the group, but it was a far less regular approach. The level of awareness of forward connecting tools was not so high but it didn't not include all in the group. The criterion for selection of citations to chaining was determined by variety of factors. These factors included the purpose of the search and the nature of research work currently being undertaken. Relevance was stated as the overriding criterion for connecting. Other important determining factors included title key words, abstracts, authors, and personal

recommendations of the source and general interest. Connecting references is not exclusive to a particular stage but may be undertaken for starting or maintaining awareness. The breadth approach for connecting citations is normally selected according to the variables mentioned in criteria above. To a certain extent automated information retrieval systems are offering a facility to follow connecting of references for follow up particular references. These information retrieval systems have to be used more.

4.3.3 Potentiality and Arranging Information

Potentiality has several connotations. The major recognized forms of browsing are understood as representing forms of semi-directed or semi-structured searching of information in an area of potential interest. Potentiality was used as means of maintaining and arranging information for use by the scanning of journals, current contents or books. Users browsing the content pages of Journals in a broad subject area checked the periodicals received by themselves and received in their library or simply browsed along the shelves of library books and journals at regular intervals. Here, potentiality was used for initial starting or familiarization, to develop an awareness of sources and to keep up to date in their respective fields. The library users are using various methods of browsing. Browsing is arranging the information sources according to the user needs. Due to scarcity of time 30% of the engineering faculty are not browsing much. Browsing is a continuous process of arranging and maintaining awareness activity, which mentioned as description of scanning Journals as preferred method of keeping up-to-date. The browsing of journals was mainly confined to Journals regarded as relevant. Browsing of current Contents occurred in 46% of cases. Simply browsing along the shelves of books and journals is not a real method of information seeking of users. Browsing mainly occurs when they are looking for new material for new project or for arranging information sources, references and keeping up-to-date by scanning regularly Journals and published literature in their field.

4.3.4 Quality and filtering information

The quality and filtering of information is an activity, which uses 'differences between sources as filters on the nature and quality of the material examined'. The activity of preferring the source to determine the factors influencing the choice of source selected by the respondent is the process of differentiating. The criteria, which seemed to be most significant for quality and filtering material,

were: topic of the study, the approach, the authors and the level and type of source. The differentiating between sources to filter material, based on quality, level and type of sources are appropriate. The credibility of author, the particular Journal or the type of source were all important factors in determining the respondent's perception of the value of Information. It is not being assumed that in every case a user wants to restrict the search to a limited type of source material. In the case of some of those involved in research work, differentiating a limited number of sources was not possible or was very difficult. The nature of their focus of interests was such that a large number of sources carried relevant or interesting material, and the individual could not be confident that this material would be picked up from a limited set of sources.

4.3.5 Awareness and updating Information

The process of maintaining awareness of developments in an area through regularly following particular sources. Maintaining awareness refers to the pattern of activity employed by the respondents in order to keep up-to-date with new developments in their topic of research or the field as a whole. The continuous monitoring of developments in a field of study was an important part of the information seeking activity of many of the users surveyed. They were principally interested in keeping up-to-date in their own fields as well as on the subject as a whole. The principal ways that respondents used to monitor developments in their fields have been identified as Informal Contacts, Journals, Books, Conferences, Newspapers, Television, Industrial Reports, Manufacture's Trade Catalogues and Computer Databases. These different ways of keeping up-to-date were not mutually exclusive for particular single source. The responses indicate that it is difficult to maintain regular monitoring of information. Information obtained through all these sources may then be integrated into the individual's overall information seeking behaviour employing different channels to complement or to form the major part of their information gathering activities. The users prefer to employ conferences, conference proceedings, professional Journals and computer search update for monitoring. Major sources were personal contacts, conferences, and Journals, including Current Contents. In general it is found that there is lack of awareness about the computer based information retrieval facilities among the users. This requires an active publicity drive to promote the optimum use of such systems.

4.3.6 Pinpointed and Focusing Information

The extracting pinpointed and focusing information from different sources may be an article in a periodical, a set of conference proceedings, a series of monographs, the contents of an archive, a collection of publisher's catalogues or bibliographies, indices, or abstracts etc. The activity usually requires the setting aside of discrete and sometimes considerable period for working through the source. It is one of the most directed and focused information seeking activities. It is an act of going through a particular service selecting and identifying material from the sources. This may be when a researcher consults the source selected. These sources are normally a set of journals, series of monographs or collection of indices, abstracts and bibliographies, including computerized information databases. The concerns of this category seek to explore the use of library services; indexing and abstracting facilities, computer based searching and to discover the respondents biggest problem in the activity of extracting. Identifying the potentially useful sources of material is a critical prerequisite to extracting from the sources. If a key source or key sources can be identified the source or sources may provide the basis for much of the information seeking activities. Pinpointed information from journals can represent a very effective means of quickly identifying material on a topic, especially if the source used is perceived as standard for a field. The use of newly published book has its complement in extracting. The availability of subject bibliographies, abstracting and indexing in the field on a particular topic or the existence of database service with exactly the right focus for the individual concerned represent obvious criteria for any user to employ these kinds of sources for extracting.

Awareness of computer based information retrieval facilities for pinpointed activities and active publicity drive to promote these facilities would give a greater usage of sources. As the approach to computer-based information retrieval was favourable with respondents expressing the view that use of such facility was time saving and useful for focusing and pin pointedly picking up of material, which is relevant.

5. INFORMATION SEEKING UNDER INTERNET PLATFORM

The Internet is an existing network used by millions of people every day. In addition, the Internet is a generic term for a bundle of technologies available under the Internet umbrella. The Internet is very similar to the global phone system. In the phone

network, whoever is a subscriber can be reached by dialling the right country code, area code and local phone number. In the case of the Internet visitors type in the right Universal Resource Locator (URL) to access the necessary information. Fig.1 presents the Information Seeking Behaviour Cycle.

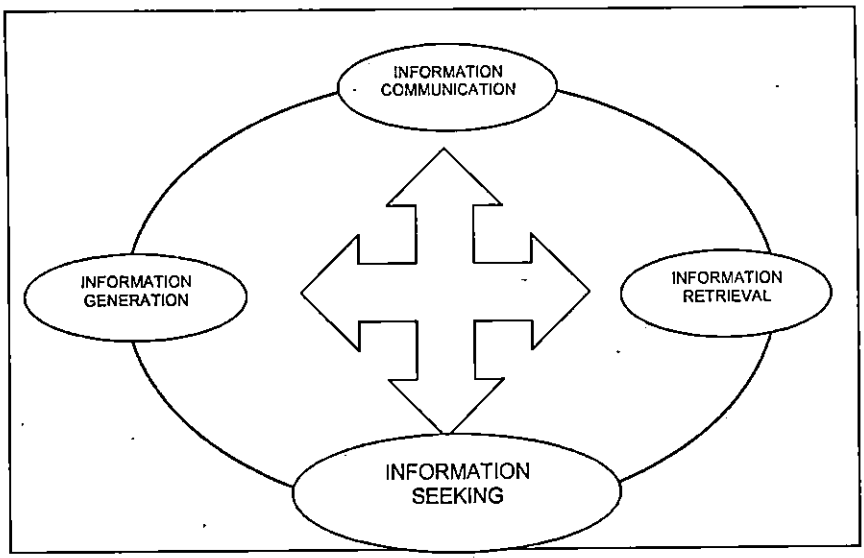


Fig. 1 Information Seeking Behaviour Cycle

Internet users today use a small but powerful set of applications. The most widely used applications are e-mail, WWW content browsing, and file transfer services. High- powered servers within the network and the software implementing those applications provide these services. The Domain Name services such as:

- It converts the widely seen host names into IP address and authorization services provide support across applications.
- Transport services provide the option for reliable transport of information (Error detection and retransmissions) or simple unacknowledged transfer. These services may operate end-to-end (e.g. in case of file transfers between and end user and a remote Internet server). In such cases, the network does not get involved at the transport level.
- In other cases (e.g. when the user is accessing a web server internal to the network), the transport service is provided by the network by UDP (User Data gram Protocol) or by TCP (Transmission Control Protocol) IP

(Internet Protocol) infrastructure enhancements provide differentiated services at the IP router level.

- These emerging capabilities and extensions to the current IP features will become key to future applications on the Internet.
- Based on this technology, in particular IP all types of networks and their services could be standardized.

Fig.1 and 2 shows the Information seeking behaviour cycle and how they are using the Internet respectively.

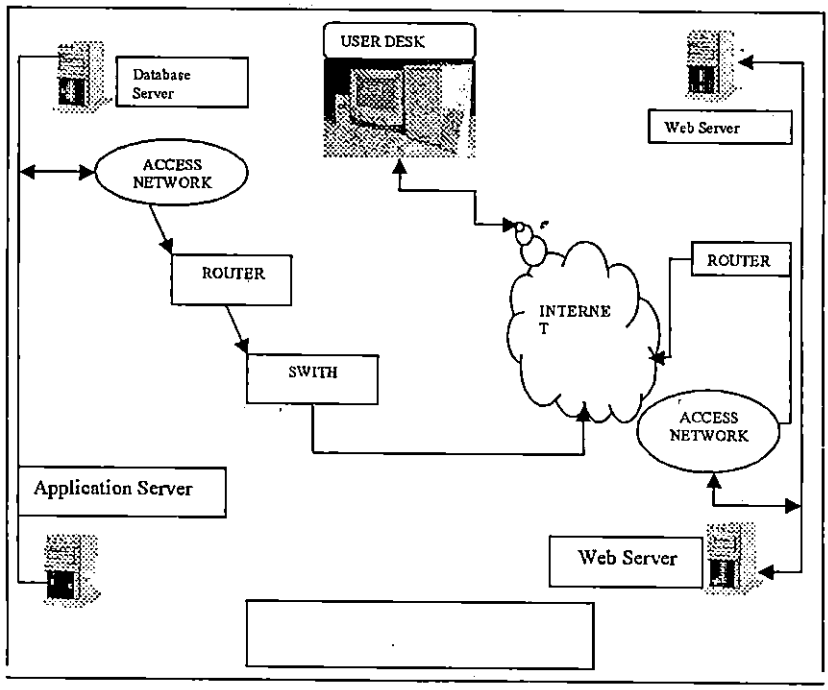


Fig.2. User Seeking Information through Internet

6. COMPONENTS OF THE INTERNET

Principle components include:

(i) Web servers that maintain home pages;
(ii) Web browsers that directly support users to view, download, and upload information to/from web servers;
(iii) Backbone offering broader bandwidth for high data volumes;
(iv) Access network offering narrower bandwidth for lower data volumes;

(v) Networking components including routers, switches, transfer shapers and firewalls;

(vi) Communication protocols such as IP for the backbone and higher layer protocols such as HTTP, FTP to support management applications.

Information Technology scenario may have directs implications on how users perceive and foster web technology. In the publishing paradigm, web as systems, which support the capture, retention and retrieval of wide information in the sense that HTML and XML pages are created and stored on a variety of web servers and retrieved through the sue of search engines. As a result, system developers may overemphasize the identification and organization of information content and the incorporation retrieval, rather than ones that foster knowledge creation, ideas, or group collaboration. The development of web technology library professionals needs to temper the predominant focus on information content and technology concerns with an awareness of the information needs and uses. In this sense, web technology is better conceptualised as socio – technology systems that merely support the retrieval of information. Hence, information seeking in digital environment is preferred to information retrieval because it is more human oriented and open-ended. The information "retrieval implies that the object must have been 'known' at some point; most often, those people who 'know' it organized for later 'knowing' by themselves or someone else" (Marchionini, 1995). Seeking connotes the process of acquiring knowledge it is more problem oriented as the solution may or may not be found. Hence, web, as information seeking system is a less technocratic and more human centred one. It aligns itself closely to the human centred models of information seeking behaviour.

7. FUTURE DIRECTION

Having presented various models of how users use the web to find information. By applying all those models along with a spreading activation algorithm, they can predict the number of requests for each web page in a web site. This has implications for e-commerce applications and web site organization not to mention a more robust understanding or overall information seeking activities concerning the web. Therefore the different models findings do not signal the end of new findings about web information seeking, but do establish a firm foundation to build upon in further research.

8. CONCLUSION

Information seeking behaviour in electronic environment of WWW represents a new kind of information resource that is more open, accessible and versatile. The user needs, approach and richness of the web pose a new challenge in the information professional's activity. The knowledge workers in academic organization use the web as part of their day-to-day research activities. The users who use the web as a part of their work engage in four models of information seeking ranging from undiverted viewing, conditional viewing, to informal seeking and formal searching. In each of these modes, users perceive information needs adopt information seeking and use the information found in distinctive ways. The study characterizes information seeking mode (i) Information generation on web (ii) Information seeking through Web (iii) Information retrieval from web (iv) Information communication through web in terms of specific sequences based on the activeness and events made by users. These findings together have significant implications for the design and evaluation of the Internet or other electronic based infrastructure for supporting knowledge work.

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KNOWLEDGE MANAGEMENT AND DIGITAL LIBRARIES

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ABSTRACT

Enterprises are realizing how important it is to "know what they know" and be able to make maximum use of the knowledge, this knowledge resides in many different places such as: databases, knowledge bases, filling cabinets and peoples' heads and are distributed right across the enterprise. All too often one part of an enterprise repeats work of another part simply because it is important to keep track of and make use of, knowledge in other parts. Enterprise needs to know. This paper discusses the intellectual or knowledge based assets, benefits of knowledge management and its challenges, and digital libraries.

KNOWLEDGE MANAGEMENT AND KNOWLEDGE NETWORKING

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ABSTRACT

This paper presents the emergence of the concept of knowledge management that has evolved with the changing society. It discusses different types of knowledge like – (i) Explicit Knowledge (ii) Tacit Knowledge and (iii) Potential Knowledge. It shows the difference between explicit & tacit knowledge to clear the confusion between the concepts. The role of Knowledge Management (KM) in business, learning and research organisations are is quite evident as could be witnessed in organisations like IBM, Microsoft, Ernest & Young, Arthur Anderson etc. This paper also highlights the role of knowledge networking as a tool or means to achieve KM on a large scale among institutions, through greater synergy of operation. Overviews of some of the prominent knowledge networks are Honey Bee, CISTI – SKN, ICICI Knowledge Park etc.

1 INTRODUCTION

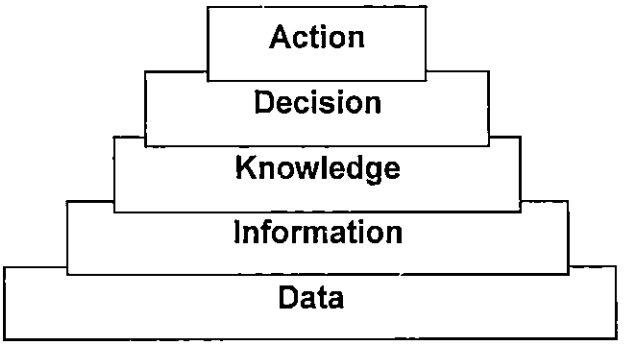
Exponential growth of Information, Information Technology and Internet has propelled the knowledge-intensive industries as a 'New Economy' and has led to the growing recognition of the importance of knowledge as a critical resource for modern business environment. The world economy has come a long way from the Agrian Age to Industrial Age and from Industrial Age to Information Age. And, now the knowledge Age has come face to face the critical challenges of the 21st century. In an era of knowledge revolution, all organisations need to be experts at identifying, codifying, retrieving and sharing know-how to secure a substantial competitive advantage.

Knowledge basically is the full utilization of information and data, coupled with the potential of people's skills, competencies, ideas, intuitions, commitments and motivations. In today's economy, knowledge is a matrix of people, money, leverage, learning, flexibility, power, and competitive advantage. Knowledge is more relevant to sustain business than capital, labour or land. Nevertheless, Knowledge provides the ability to respond to novel situations, it remains the most neglected asset today..

2 KNOWLEDGE

Information and knowledge could be seen as closely related and complementary stages along the same road and as such, both perform essential roles in the decision making process. Wilson (1996) presents a useful illustration of this with the notation of processing hierarchy. This shows that by selecting and analysing data, information can be produced; selecting and combining information can generate knowledge generated; from this, decisions can be made and action can be taken. Wilson has produced a simple, yet extremely helpful diagram, setting out the inter-relationships of the different concepts, with a short textual example, which puts it into an everyday context.

Fig.1 The Processing Hierarchy



Short Textual Example

"For instance, if you are standing on the platform at Paddington station waiting to go to Oxford, you may consult a timetable (data) to look up the departure time of the next train (information). Then, you may look at your watch to see what time it is (more information) and subtract this from the departure time so that you know how long you have to wait (knowledge). Along with the knowledge of the other options open to you, you can then decide what there is time for: enough only to board the train? ... or to buy

a newspaper first? ... or to sit down with a newspaper, coffee and bun? (decision and action)" (Wilson ,1996).

Various experts associated with the field of knowledge Management (KM), have propounded different views on the types and classification of knowledge. However, we would employ the following generally accepted categorisation:

2.1 Explicit Knowledge

Explicit knowledge, referred to as procedural knowledge, refers to knowledge that is or can be, written down or in other words documented. According to Nonaka and Takeuchi (1995)[2], explicit knowledge is that which 'can be expressed in words and numbers and can be easily communicated and shared in the form of hard data, scientific formulae, codified procedures or universal principles'.

2.2 Tacit Knowledge

Tacit Knowledge refers to the knowledge that a being needs to act and react in its environment, for example to play cricket. It is unformulised, related to intuitions, feelings and emotions. Tacit knowledge can not be easily documented or explained; tacit knowledge is best transferred through an apprenticeship model, and often requires skills that supersede pure instruction.

A good example of tacit knowledge is the ability to ride a bicycle or a bike. We know how to ride a bicycle or a bike but it is very difficult to explain in words to others and document it in the form of a manual on how he/she learnt this skill.

2.3 Potential Knowledge

Potential Knowledge represents business intelligence and refers to knowledge that can be extracted from the highly structured data stored in databases – ERP (Enterprise Resource Planning) systems and business operational applications. An organisation contains voluminous amount of data from various sources and in various formats. The prime sources are the databases spread across the various divisions and departments within the organization. Data mining techniques can, under favourable conditions, extract valuable knowledge from an organisation's databases.

2.4 Explicit Knowledge Vs Tacit Knowledge

	Explicit	Tacit
Features	Easily codified, easily communicated and shared, transferable, and easily expressed	Highly personal, Internal, hard to formulize, difficult to capture, communicate, transfer and share

Sources	Formulae, procedures, manuals, reports, figures, numbers, codes	Informal communication, people's skills, intelligence, emotions, behaviour, personal experiences, and historical understanding.

3 KNOWLEDGE MANAGEMENT (KM)

Sometimes people are confused about the subject of knowledge management. People wonder "what exactly is it?" Or alternatively "is it a new name for information management?" But, we know that information is not a synonym for knowledge, which is an intellectual concept, referring to the condition of knowing or understanding something.

According to Barron, "Knowledge Management is an integrated, systematic approach to identifying, managing, and sharing all of an enterprise's assets, including databases, documents, policies or procedures, as well as previously unarticulated expertise and experience held by individual workers"[1]

According to Gartner Group "KM is an emerging set of process, organizational structures, applications and technologies that aim to leverage the ability of the capable, responsible, autonomous, individuals to act quickly and effectively. It achieves this end by providing this capable, responsible, autonomous individual with ready access to enterprises and the entire store of knowledge, including much of what is known but not documented."

From the above discussion we can say that KM is:

- Supporting new ideas, encouraging innovation, improving an organization's decision making process
- Capturing experiences and insight and render them reliable as and where needed by whomsoever concerned.
- Fostering collaboration, knowledge sharing and continuous learning
- Increasing the intellectual assets of the company and adding value to the same
- Studying how knowledge gets created and facilitating the creation of new knowledge on a continuous basis

3.1 Why should we use Knowledge Management?

i) Increasing employee turnover: It helps to capture and retain the employee's knowledge, experience and expertise

ii) Fast changing technologies: It puts technology into a proper perspective and promotes innovations

iii) International competition: The competitors are no longer limited to a particular location or region as the markets are

increasingly becoming global. Keeping up with the latest developments and anticipating threats or ensuring opportunities in other countries is a tedious, time-consuming and difficult process. KM technology, acquired from the right sources, can deliver relevant and timely knowledge.

iv) Decision making: It helps to take quick decisions during business meetings.

V) Knowledge sharing culture: It develops a knowledge sharing culture in the organisation and breaks communication barriers within the organisation.

Vi) Duplication of work: It reduces duplication of the efforts of knowledge workers.

3.2 KM Success factors

- Knowledge sharing culture
- Top Management support
- Knowledge champions and stewards
- Technological Infrastructure
- Rewards and incentives for KM participation

3.3 Some Basic Technologies in KM

- Intranet
  - Discussion Forums
  - Chat, Mailing lists
  - Collaborative data collection
- Group ware
- Lotus note
- Data ware housing
- Data mining
- Document Management
  - Scanning
  - OCR
  - Data compression, formatting, storage
  - Indexing & retrieval
- Digital Library Management

3.4 Some companies using KM

Many industries are becoming knowledge-intensive industries. They have recognized the importance and ability of knowledge in the current IT environment. Storage and retrieval of knowledge leads to value creation and value addition. Lots of companies are managing knowledge to get competitive advantages. Some of these are IBM, Microsoft, Ernest & Young, Arthur Anderson,

Buckman Laboratories, McKenzie, Wipro, Infosys, Aptech, Satyam, Citol, Hughes software.

4 KNOWLEDGE NETWORKING (KN)

Knowledge networking is a tool or means to achieve KM on a larger scale among institutions of similar nature through a greater synergy of operations. A basic knowledge network may be defined as a network of individuals or institutions for sharing knowledge in any given area. In the commonwealth and CAPDD[8] (Commonwealth Action Programme for the Digital Divide) context, it may be defined as an electronic (e-mail, internet, intranet, video conferencing) network between individuals/groups/institutions, to share knowledge and resources for solving development problems and building capacity. The networking and interaction can be in thematic areas, like science and technology, or in areas of interest to member countries. Some well-known knowledge networks are

- CISTI – SKN
- ICICI Knowledge Park
- Trade Knowledge Network (TNK)
- www.intersurvey.com (marketing information KN)
- David Skyrme: Knowledge Network
- Greater Noida Knowledge Park
- www.cos.com (Community Scientists)
- www.proz.com (translators)
- Penn State Behrend College KP
- Networking of Social scientists (ICAR)
- Palestinian Network of S&T (Palesta Website)
- Pacific Bell knowledge Network (www.kn.pacbell.com)
- Biogrid – Network of DST, Ministry of science & Technology
- Bio-Informatics Network of India
- Disaster Management Network
- New Millennium Indian Technology Leadership Initiative of Ministry of Science & Technology

4.1 Overview of some Knowledge Networks

4.1.1 CISTI – SKN[7] (www.cisti.nrc.ca)

Canada Institute for Scientific and Technical Information – Scientific Knowledge Network (CIST – SKN) is the project of National Research Council (NRC) of Canada on S&T and medical information. SKN co-ordinates people information and technology. It is getting 3000 queries per day from seven regional information centres.

Components of SKN

- Biblionets
- National Digital Science Library
- Grey Literature Full Text database
- Technology watch
- Expanding Regional Presence
- Development of software and improving connectivity

4.1.2 Honey Bee Network of SRISTI[15] (www.sristi.org)

Society for Research & Initiatives Sustainable Technologies and Institutions started Honey Bee Network ten years ago to help farmers, artisans and other grassroots level innovator to commercialize their ideas and be rewarded for the same.

It has created several databases of thousands of innovative practices in many formats in English, Gujarati etc.

It is a voluntary network of creative people, policy makers, scientists, NGOs and individuals interested in helping grassroots innovators.

The basic objectives are:

- Documenting of indigenous technologies
- Adding value by scientific research, building text/ databases and rendering them accessible electronically
- Building an electronic network for exchange of ideas and experience (braking barriers of region, religion, language, culture etc.)
- Finding out and implementing methods of rewarding and encouraging innovation, benefit-sharing mechanism
- Protecting of Intellectual Property Rights and giving due credit to innovators

4.1.3 ICICI Knowledge Network[11] (www.icicknowledgepark.com)

It is developed and funded by ICICI and supported by the Government of Andhra Pradesh . This park covers 200 acres of land and is situated 40 Kms from the Hyderabad city, providing top class facilities for scientific R&D work. It is a network of premier academic and industrial R&D institutions.

Role of ICICI knowledge Park (IKP)

- A park to provide total infra-structural facilities to industrial R&D activities
- Supports not only product development but also idea generation, sharing and exploitation
- Intended for industrial R&D establishments in India and abroad among the scientific research community
- Acts as an institution-industry interaction facilitator

Beneficiaries

There are three categories of beneficiaries like: Tenants of the park, Members (Participants) and Registered users. Each member participant signs an MOU with IKP. MOU covers a commitment to share ideas, knowledge, information about facilities, instruments, expertise, library resources with IKP community. The current thrust areas are knowledge intensive sectors like: Biotechnology, Pharmaceuticals, New materials, Information Technology, Agribusiness. Some of the member organisations are:

- Centre for Cellular & Molecular Biology, Hyderabad
- Indian Institute of Chemical Technology, Hyderabad
- University of Hyderabad
- National Chemical Laboratory, Pune
- National Institute for Nutrition, Hyderabad
- Anna University, Chennai
- Central Drug Research Institute, Lucknow
- Centre for Biochemical Technology, Delhi
- Indian Institute of Chemical Biology, Calcutta
- Indian Institute of Science, Bangalore
- Indian Institutes of Technology
- Industrial Toxicology Research Centre, Lucknow
- National Institute of Immunology, Delhi
- University Department of Chemical Technology, Mumbai
- ICRISAT & INFLIBNET

ICICI Knowledge Park developed a Virtual Information Centre (VIC). It includes:

- Databases of people and their expertise, facilities, publications, patents, events and projects of participating institutions
- Extension of library activities
- Online & CD-ROM based searches
- Discussion lists: newsletters, idea bank
- Linking up digital resources of participating libraries (say OPAC, Union lists etc.)
- Extending library and literature search facilities of online and CD-ROM databases on MOU terms to members
- A web interface for virtual meeting, sharing and discussion of ideas & experiences
- Helps in patenting and IPR activities

E-content on Virtual Information Centre in the website

- Union Catalogue of serials
- Directory of translators
- Directory of IPR agents and attorney

- Network members resource directory
- S&T events database
- E-mail Directory of Indian scientists
- Database of internet resources
- Directory of venture capital firms in India
- Directory of experts in Indian Universities

4.1.4 Trade Knowledge Network (TKN)[16]: www.tradeknowledgenetwork.net

The Trade Knowledge Network (TKN) is composed of research and policy institutions in Africa, Asia, Europe, North and South America that are exploring the connection between trade and sustainable development and working to ensure that increased international trade can contribute to sustainable development in their countries and regions. The goal of the Trade Knowledge Network is to foster the long-term capacity to address the complex issues of trade and sustainable development in partner-country research institutions, governments and the wider policy community, including business, academia, and environment and development NGOs.

The Trade Knowledge Network has three inter-related objectives to achieve this goal:

1. to produce high-quality, objective, in-country and thematic research to increase awareness, knowledge and understanding of the sustainable development dimensions of trade;
2. to utilize policy workshops and other fora to inform and promote dialogue among policy-makers and stakeholders in TKN countries as a means to incorporate sustainable development into trade policy, negotiation and application at the country and international level; and
3. to facilitate through the Trade Knowledge Network, its partners and among broader global audiences, the exchange of information, best policy and practice on trade and sustainable development.

The Trade Knowledge Network is managed collaboratively by the International Institute for Sustainable Development (Canada) and the International Centre for Trade and Sustainable Development (Switzerland). The TKN is supported by the Rockefeller Foundation; the Norwegian Ministry of Foreign Affairs; the International Development Research Centre (IDRC); the Swiss Agency for Development and Cooperation (SDC); and the Canadian International Development Agency (CIDA).

4.1.5 National Disaster Management Network

National Disaster Management Network was set up by CSIR in May 2000. This knowledge network has been designed to give a fillip to technical co-operation among developing countries and to expand international relationships, to include exchange of information and transfer of technology.

The KN aims at not only ensuring a swift flow of information but also its authentication. It also aims at enriching its content through a flow of knowledge from the foreign language literature.

4.1.6 BTISNET (Biotechnology Information Systems Network)[6]: www.btisnet.nic.in

This network is developed and launched by Department of Biotechnology in 1986 – 87. More than 10,000 scientists are working through a network of ten distributed information centres and 38 sub-distributed information centres. VSNL, UGC, CSIR, ICARDOE, NIC have collaborated in making this network.

Main activities of this KN are database development, R&D, human resource development, strengthening bio-computing and networking facilities, establishing mirror sites in biology, genomics and international collaboration.

4.1.7 BIO-GRID INDIA[10] (www.dbtindia.nic.in/programmes/bitsnethome.html)

The Department of Biotechnology (DBT) has estimated that it will spend Rs.90 crores on bioinformatics research and infrastructure between 2000 and 2005. It has sought the government's approval to set up a National Bioinformatics Institute and teraflop scale supercomputing facilities at selected bioinformatics centres. A National Supercomputing facility has recently been established at the Indian Institute of Technology-Delhi towards in-silico (on computer) drug development by using bioinformatics resources. The DBT has also set up a high-speed, large bandwidth Virtual Private Network (VPN) linking bioinformatics centres in public-funded institutions. At present, 11 institutions have been linked through this VPN. This network is called BIOGRID INDIA.

As part of BIOGRID, mirror sites of internationally recognised databanks such as genome data bank, protein data bank, plant genome data bank, databases of European Bioinformatics Institute (EBI) and public domain bioinformatics software packages have been established. These sites are designed to act as `knowledge pathways' for discoveries in biotechnology. The DBT estimates that the BTIS centres' resources are being used by more than 12,000 scientists around the country.

4.1.8 Knowledge Networks[12] (www.intersurvey.com)

This is a KN for anything to do with marketing brand positioning, brand extension, brand loyalty, brand equity, consumer insight,

predictive intelligence etc. **Knowledge Networks** was founded in 1998 by two prominent Stanford University professors seeking to develop research methodologies for the next century. Their company quickly grew into a leading consumer insight provider, with numerous Fortune 500 clients. Boasting an average annual growth of about 75% over the past two years, Knowledge Networks is now among the top 25 U.S. research firms in terms of revenue.

4.1.9 Skyrme's Network[14] (www.skyrme.com)

David Skyrme Associates is a networked management consultancy specializing in advising senior executives and policy makers on how to create and implement successful knowledge-based strategies. It is an organisation that helps industries in KM & KN as a part of it.

It has expertise in the following areas:

- Knowledge management - planning and implementation
- knowledge-based strategies – developing strategies to exploit knowledge
- Knowledge commercialization - including online knowledge markets
- KM tools and techniques - analyzing developments and best practice
- Internet / intranet design - including deployment of content management systems
- Internet marketing
- Virtual working - virtual teaming and virtual organizations.

5 Conclusion

Knowledge is the most precious and powerful asset, which must be protected and stored for further innovations to secure the companies in a competitive world. Most of the renounced companies now have realized the importance and usefulness of KM in today's fast changing scenario. These companies have started to adopt long term knowledge management planning and strategies to protect their knowledge assets for reuse and innovation in the future. Business knowledge, in fact, refers to the knowledge regarding markets, products, technologies and organisations, that a business owns or needs to own and which enables its business process to generate profits, add value etc. KM is not only about managing these knowledge assets but also managing the processes that act upon the assets. The processes include: developing knowledge; preserving knowledge; using knowledge and also sharing knowledge.

In many respects, knowledge management is a journey that never ends. This is so ours is a dynamic, constantly evolving environment, posed new challenges and obstacles. Whether this journey is worthwhile or not, depends upon the benefits of the KM programme which it is able to deliver along the way.

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KNOWLEDGE MAPS

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ABSTRACT

One of the latest topics, which have caught the attention of knowledge workers, is the fast emerging concept of Knowledge Management. Information scientists take pride in calling themselves as Knowledge managers; hence it is essential to understand this complex domain called knowledge management. The increased out put of library professionals from schools of library & information science, has brought the job market to almost a stand still in our country and this demands imparting more job oriented education and training for the library professionals, so that they can survive by seeking jobs in industries where Knowledge Management is essential rather than Information Management. The major aim of this article is to illustrate knowledge management concepts through knowledge mapping technique.

1. KNOWLEDGE MANAMGENT: A CROSS – DISCIPLINARY DOMAIN

One of the latest topics, which have caught the attention of Knowledge workers, is the fast emerging concept of Knowledge Management. Though this concept has been originated from the

field of Management, it is a cross – disciplinary domain that has been drawn form a wide range of disciplines and technologies, such as cognitive science, expert system, information management and organizational science etc. Different verities of information technology tools are utilized in managing organizational knowledge assets such as data- mining, electronic publishing, and multimedia and so on.

The complexity of this domain has resulted in the emergence of various definitions and ideas, which led to interesting debates and discussions in number of platforms. Another domain that is gradually metamorphosing itself into a cross- cultural discipline is none other than library and information science.

Information scientists take pride in calling themselves as knowledge managers; hence it is essential to understand this complex domain called knowledge management. Apart from this, the increased out put of library professionals from schools of library and information science, has brought the job market to almost a stand still in our country and this demands imparting more job oriented education and training for the library professionals, so that they can survive by seeking jobs in industries where Knowledge Management is essential rather than information management. That does not mean one can dispense with Information management because it is a sub domain of knowledge management.

An organizations competitive spirit and ongoing sustainability primarily depend on their ability to continuously redefine and adapt to their goals, purposes, and ways of doing things. This can be achieved by extracting knowledge from the various data and information pools intrinsic as well as extrinsic to an organization. Knowledge can be anywhere, and understanding knowledge can be difficult until the use it becomes clear.

2. KNOWLEDGE MAPPING

Knowledge Eco System consists of individuals in communities who are co-located either in the same place or different organizations. The persons from the same communities or from different organizations continuously create ideas knowledge, and propagate tools, principles, theories etc. This knowledge has to be integrated, shared and used for generating more effective or useful knowledge with innovative ideas. Effective communication

of knowledge requires through understanding of the problem, conceptualizing knowledge and representing it in the form of a analogy or diagram. Knowledge engineers make use of number of ways of representing knowledge, which are also called as knowledge models or knowledge maps.

A knowledge map is a navigational aid for illustrating Explicit and Tacit knowledge of any organization. It highlights the importance and relationships between knowledge stores and the dynamics. It helps to represents sources, flows, constrains and loses. It also highlights knowledge pools, competencies, practices and system activities. Sources of construction of knowledge maps are news, contact addresses, patent information databases records, and documents process description, competitor's information and so on. There are number of software, which are used for representing knowledge maps. The maps in this article have been drawn using CMAP TOOLS, A Knowledge Modeling kit (ver 3.5).

3. CREATING MAP USING CMAP

It consists of concepts, which are interconnected to represent knowledge. Arrows indicate the direction of knowledge flow. Concepts should be identified and they should be connected in a logical manner using appropriate links.

3.1 Knowledge Mapping Strategy

Knowledge mapping quite simply is any visualization of knowledge beyond textual for the purpose of eliciting, codifying, sharing, using and expanding knowledge. Organizations today are focused on the intellectual analysis of knowledge management and knowledge strategy. Often this cerebral view causes them to overlook a valuable tool for sharing, creating, analyzing and building upon knowledge, called knowledge mapping. The history and uses of knowledge mapping show the length of time and wide variety of applications.

The four areas of knowledge mapping strategy are as follows:

3.1.1. Customers

These include those who buy and those who don't. Valuable knowledge can be gleaned from both. Customer relationship management (CRM) is currently known to be a vital component of any knowledge management strategy.

3.1.2. Collaborators

This area covers strategic alliances, service providers, joint ventures, regulatory bodies and anyone with whom an organization must collaborate and cooperate in the course of conducting business.

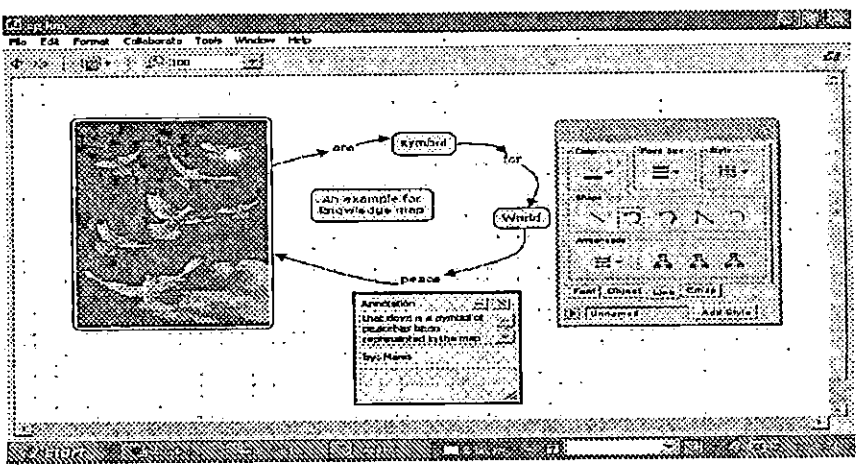
3.1.3. Competitors

Those who may or may not compete directly (for example provide different products or services) but who target the same market may be considered competitors. The value in examining them is not just to best them but also to dig a different niche or form trans-competitive relationships or strategic alliances.

3.1.4. Corporation/Organization

This stands for the internal organization from corpus for body, so can include individuals, non-profit, government and industry or any body considering a knowledge management strategy.

Fig 1 Concept Map



The above figure indicates the concept that dove is a symbol of peace. It is only a small example, which indicates that a concept can be represented by text or by a picture also. It also presents the style palette and the annotation box.

effectively and to develop sustainability in the competitive environment.

4. TYPE OF ORGANIZATIONAL KNOWLEDGE

Social knowledge emerges from social institutions and needs to control the behaviors. The business environment the accumulation of social knowledge results in the corporate culture. Axiomatic knowledge is the basic knowledge that is believed to be intrinsic within organizational employees and adds to the organizational knowledge process. Axiomatic Knowledge constitutes logic and mathematics. Existential knowledge is about what exists. An individual acquires the initial existential knowledge by using their axiomatic knowledge to integrate to represent a concept or use it for specific purpose. To gain further existential knowledge, the individuals employ their axiomatic knowledge, and the existential knowledge.

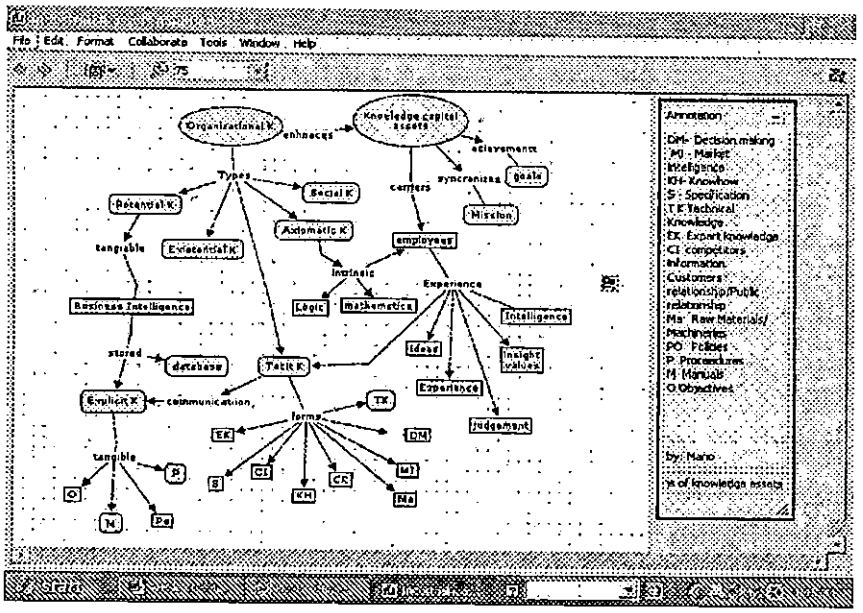
5. KNOWLEDGE LIFE CYCLE

Knowledge has a definite lifetime and becomes obsolete with passage of time. When explicit knowledge is used it becomes implicit knowledge. When the implicit knowledge is documented and stored in a format it again becomes explicit knowledge. Tacit knowledge has to be continually enhanced through communication to others and then re-circulated back into explicit information for later use.

6. KM AND INFORMATION MANAGEMENT

KM focuses on the processes and the people involved in creating, sharing, and leveraging knowledge. Information management is more concerned with the processing of information such as gathering, organizing, summarizing and packaging information and ensures timely delivery to the right decision makers based on the situation involved.

Fig 2 Industrial Knowledge Asset Map

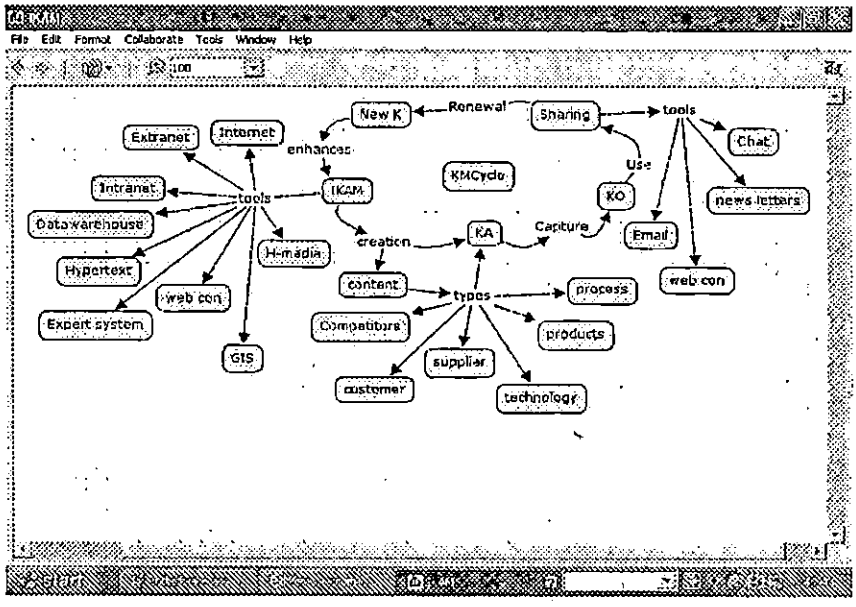


The above figure indicates the knowledge map of the various knowledge assets of an industrial organization and their links. Tacit knowledge is not structured, intangible and cannot be recoded. It represents experience ideas insides values and judgment of people. Explicit knowledge is referred as procedural knowledge, which can be written or documented. Explicit knowledge is semi- structured and represents tangible or recorded knowledge.

The employees who have acquired knowledge about their organization are carriers of knowledge capital. They carry a shadow of the company's knowledge capital, which, is the most important asset of an organization. This never gets reflected in the financial capital. Knowledge assets are important for managers to manage the organizational efficiently. The total knowledge capital is translated by summing up the value of patents, software, and trained people.

Potential knowledge represents business intelligence. It is essential that the knowledge synchronize with the organization's mission, strategy and development of organizational climate. Organizational knowledge is an essential asset, which can dramatically improve organization's ability, to achieve its goals

Fig. 3 Knowledge Management Cycle and Tools



Knowledge management process involves five distinct activities such as Knowledge creation, Knowledge capture, Knowledge organization, Use, Sharing and Renewal. Implementation of knowledge management leads to a cyclic process as shown in the above figure. The tool for the KM has been illustrated in the above map which is self-explanatory. The knowledge assets of an industry can be grouped into major six categories. They are knowledge regarding product, process, supplier, technology, customer and competitors. Efficient Knowledge asset management requires tools such as networks, data warehouse, expert system etc., Knowledge acquisition involves developing methods and tools that make the difficult task of capturing and validating the industrial knowledge assets. Knowledge organization involves information management and designing decision support systems. Sharing of knowledge has become a child's play in the present age of Information technology. The value of knowledge will be enhanced only by its use, which creates a dynamic state of emergence of new knowledge.

7. CONCLUSION

Generating knowledge maps needs clear understanding of the concepts and ability to represent them in a logical manner with proper links. The maps help to convey information for validation and decision-making

This technique of knowledge representation will be quite useful for information professionals since such symbolic knowledge representation could be stored in the databases, which can provide various representational views of any industrial problems

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KNOWLEDGE ORGANISATION IN ACADEMIC LIBRARIES

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ABSTRACT

Modern technology has radically altered the nature of our society and style of working of the people. Computerized techniques have impact on all walks of life right from production units, industries, educational institutions, and communication agencies to all services sectors. Library and Information Services can't lag behind but require a change in the tune of the progress of the civilization, keeping in view the requirements of time, technological developments and global change. Conventional librarianship has altogether given way. Libraries are gradually becoming information centers. Modern users need more and more information in minimum time. Accordingly modern libraries are trying to provide timely access to relevant information by introducing new techniques to provide rapid access to precise information. The traditional process of organizing, retrieving and dissemination of information are out of date and time consuming. Information technology is now-a-days highly effective in meeting the needs of present era; as computers have become increasingly a part of modern life.

The paper describes the computerization in academic libraries in general and advocates for proper planning, keeping in mind the objectivity of automation. Enumerates the various steps needed to organize the automation work. Stresses on planning the work in phases to have cost effective operation. The author perceives the automation activity of academic library as a transition phase that can build up an all-together new image of academic libraries in terms of efficiency and specialized library services.

KNOWLEDGE ORGANISATION IN INFORMATION TECHNOLOGY ERA

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ABSTRACT

The case study results on the awareness and development of changing environments and adoption of new information technology tools to libraries. The authors approach is for knowledge organization through application of Information Technology and resources including databases, hypertext linkages, and full text search and networking technology. Knowledge organization caters to the critical issues of organizational adoption, survival and competence in face of increasingly discontinuous environmental change. Essentially, it embodies organizational processes that seek synergistic combination of data and information processing capacity of information technologies and the creative and innovative capacity of human beings. In the words of the knowledge scholar Takeuchi, "In an economy where the only certainly is uncertainty the sure source of lasting competitive advantage is knowledge". The focus of industrialized economics is surely shifting from natural sources to intellectual assets. Therefore, knowledge organization is fast emerging as a core strategy that organizations worldwide are adopting to manage and leverage organizational knowledge for sustainable library advantage.

1. INTRODUCTION

Knowledge Management represents organizational process that seeks a synergistic approach. It should include a combination of data and information processing capacities of information technologies and innovative abilities of human beings. The term knowledge management is often misunderstood to be a purely technological or an organizational concept. But knowledge management is a systematic approach that ranges from technology driven methods of accessing, controlling and delivering information to massive efforts in transforming corporate culture.

Human beings create, retain and develop knowledge. This remains as our memory. Memory guides us in our future. Similarly organizations also need to retrieve knowledge. Knowledge management helps in capturing, organizing and retrieving knowledge. But the process cannot be efficient if the entire process is repeated for routine tasks. Knowledge remains in three forms in an organization: individual memory. Organizational memory can be successfully implemented if knowledge is accessible and shared for all the employees in the organization.

Organizational memory is the central storehouse of knowledge management in an organization. It provides a shared information space that supports people in an organization to do work. Inside an organization it remains in implicit as well as in explicit form. The most obvious places include information repositories such as corporate manuals, databases, filling systems etc. Additionally, individuals are a prime location for retention of the organizations knowledge. However, organizational memory can be retained in many other places, including organizational culture, processes and structure.

Bob Halls Worth (1999) provides his views as below:

(i) That knowledge should be not just, information and not just data.
(ii) That it should be available from wherever it is needed, to all those authorized to receive it. (Given mainly Commercial/Intellectual Property Rights).
(iii) That both Input and Output must be simple.
(iv) That it should only be entered once-and then kept up to date "and" relevant to the enterprise.
(v) That the language should be simple and appropriate.

(vi) That the information should always support the learning organization.

That the users probably have not fully thought all the aspects of developing knowledge strategy-Its implications if they do, and its implications if they do not. There is no universal definition of KM, just as there's no agreement as to what constitutes knowledge in the first place. For this reason, it is best to think of KM in the broadcast context. Succinctly put, KM is the process through which organizations generate value from their intellectual and knowledge-based assets. Most often, generating value from such assets involves sharing them among employees, departments and even with other libraries in an effort to devise best practices. It is important to note that definition says nothing about technology; while information technology (IT) often facilities KM, technology by itself is not KM.

2. INTELLECTUAL BASED ASSETS

Not all information is valuable. Therefore, it is up to individual libraries to determine what information qualifies as intellectual and knowledge-based assets. In general, however, intellectual and knowledge-based assets fall into one of the two categories: explicit or tacit. Included among the former are assets such as patents, trademarks, business plans, marketing research and user lists. As a general rule of thumb, explicit knowledge consists of anything that can be documented, achieved and codified, often with the help of IT. Much harder to grasp, is the concept of tacit knowledge, or the know-how contained in people's heads. The challenge inherent with tacit knowledge is figuring out how to recognize, generate, share and manage it. While IT in the form of e-mail, groupware, instant messaging and related technologies can help facilitate the dissemination of tacit knowledge. Identifying tacit knowledge in the first place is a major hurdle for most organizations.

3. KNOWLEDGE MANAGEMENT BENEFITS IN LIBRARIES

Some benefits of KM correlate directly to bottom-line savings, while others are more difficult to quantify. In today's information-driven economy, libraries uncover the most opportunities-and ultimately derive the most value-from intellectual rather than physical assets. To get the most value from a library's intellectual assets, KM practitioners maintain that, knowledge must be shared

and serve as the foundation for collaboration. Yet better collaboration is not an end in itself; without an overarching sources context, KM is meaningless at best and harmful at worst. Consequently, an effective KM programme should help a library do one or more of the following:

(i) Foster innovation by encouraging the free flow of ideas.
(ii) Improve user service by streamlining response time.
(iii) Boost revenues by getting sources and services to IT faster.
(iv) Enhance employee retention rates by recognizing the value of employee's knowledge and rewarding them for it.
(v) Streamline operations and reduce costs by eliminating redundant or unnecessary.

These are the most prevalent examples. A creative approach to KM can result in improved efficiency, higher sources and increased revenues in practically any library function. Therefore, Knowledge is the full utilization of information and data, coupled with the potential of users skills, competencies, ideas, intuitions, commitments and motivations. In today's economy, knowledge is people, money, leverage, learning, flexibility, power and competitive advantage. Knowledge is more relevant to sustained libraries than capital, labour or land. Nevertheless, it remains the most neglected asset. It more than justified true belief and is essential for action, performance and adaptation, knowledge providers the ability to respond to novel situations.

4. KNOWLEDGE MANAGEMENT AND INFORMATION TECHNOLOGY

Knowledge management involves data mining and some method of operation to push information to users. Some vendors are offering source to help an enterprise inventory and access knowledge resources. IBM's Lotus Discovery Server and K-Station, for example, are sources exhibition as providing the ability to organize and locate relevant content and expertise required to address specific library tasks and projects. They are said to be able to analyze the relationships between content, people, topics and activity and produce a knowledge map report.

In an information week article, Angus Jeff and Jeetu Patel (2000) describe a four-process view of knowledge management and presented in Table 1.

Table-1 Four-Process view of Knowledge Management

This major process	Includes these activities
Gathering	➢ Data entry ➢ OCR and scanning ➢ Voice input ➢ Pulling information from various sources ➢ Searching for information to include
Organizing	➢ Cataloging ➢ Indexing ➢ Filtering ➢ Linking
Refining	➢ Contextualizing ➢ Collaborating ➢ Compacting ➢ Projecting ➢ Mining
Disseminating	➢ Flow ➢ Sharing ➢ Alert ➢ Push

A Knowledge management plan must involve a survey of corporate goals and a close examination of the tools; both traditional and technical those are required for addressing the needs of the library. The challenge is to select build software that fits the context of the overall plan and encourage to users to share information.

Of all the libraries trends of the past decade perhaps none-possibly excepting reengineering-is more closely associated with technology than knowledge management. Quality Circles do not demand a computer, nor does the development of a learning organization. Technology will likely play an enabling part in these activities but not to the extent accessioned by Knowledge Management. In fact, KMPG LLP's Chief Knowledge Officer, Michael J.Turillo (2000) says, "Knowledge Management cannot be done without Technology".

May be not. Knowledge Management is in danger of being perceived as so seamlessly entwined with information technology that its true critical success factors will be lost in the pleasing hum servers and software's. As vendors label their Document

Management, Database or Groupware Resources "Knowledge Management Solutions", executives can be excused for mistaking the software for the solution. It is not.

According to Yogesh Malhotra (2000), Founder Chairman and CKO of British Institute at Fort Lauderdale have identified some myths that surround the murky confluence of Information Technology and Knowledge Management.

(i) Knowledge management technologies deliver the right information to the right user at the right time. This idea applies to an outdated libraries model. Information systems in the old industrial model mirror the notion that libraries will change incrementally in an inherently stable market and executives can foresee change by examining the past. "The basic premise is that we can predict.... How and what we will need to do and that information system can simplify this and do it efficiently". The new library model of the Information Age, however, is marked by fundamental, not incremental, change. Libraries cannot plan long-term; instead, they must shift to a more flexible "anticipation-of-surprise" model. Thus, it is impossible to build a system that predicts who the right person at the right time even is, let alone what constitutes the right information.

(ii) Information Technologies can store human intelligence and experience. Technologies such as databases and groupware applications store bits and pixels of data. "But they cannot store the rich schemes that users posses for making sense of data bits". Moreover, information is context-sensitive. The same assemblage of data can evoke different responses from different users. The reason for its importance is that many information textbooks say that while users come and go their experience can be stored in databases. But unless we can a person's mind and store it directly into a database, we cannot put bits into a database and assume that somebody else can get back the experience of the first person.

(iii) Information technologies can distribute human intelligence. Again, this assumes that libraries can predict the right information to distribute and the right

users to distribute it to. And by passing the distribution issue by compiling a central repository of data for users access does not solve the problem either. "The fact of information in a database does not ensure that people will see or use the information". Most of our knowledge management technology concentrates on efficiency and creating a consensus-oriented view. The data there in is irrational, static and without context". And such systems, do not account for renewal of existing knowledge and creation of new knowledge. When it is heard that KM is an IT-based activity, capitalize "I" and lowercase the "T". But the T has got lot of significance in itself as a state-of-the-art technology and the knowledge discovery sources available to the corporate are indeed mind-boggling. The technologies and sources available are enlisted below along with their features in order to give an overview regarding the technology edge in knowledge management.

5. CONCLUSION

Over the last few years, the corporate world has seen the emergence of interest in knowledge management and adoption of the term by information technology vendors and library solution providers. However, despite the popularity of the buzzword, most such implementations have been based on an outdated library model and related information processing view. It may be even argued that in several cases, it is difficult to justify why specific information technology solutions fall in the realm of knowledge management rather than within the scope of good information management or data management. This ambiguity about what is knowledge management and how it contributes to library performance has led some consultants to recently remark that knowledge management is a fad.

There is need for developing better and more accurate understanding of knowledge management as enabler of information strategy for the e-world of libraries. Departing from the information-processing perspective of knowledge management that was relevant to the library world of information of the past era, a new perspective of knowledge management is presented. The presented conceptualization of knowledge management is based on the need for synergy between the capabilities of advanced

information technologies and human creativity and innovation to realize agility demanded by emerging library environment.

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MIGRATION OF USER COMMUNITY FROM ON-LINE TO CD-ROM FOR COST EFFECTIVE BENEFITS

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ABSTRACT

The most distinguished future of CD-ROM technology is that it holds huge amount of data/information with amazing speed of retrieval of such information when required. This paper analyses why the user community has migrated from online search to CD-ROM utilization. The advantages of using CD-ROM when compared to online search i.e., cost effectiveness and reliability. Anticipated future developments in these directions are briefly discussed.

PRESERVATION ISSUES OF DIGITAL RESOURCE

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ABSTRACT

Digitization has changed the entire concept of the ways scholars, students and general population finds and uses scholarly information, and its dissemination. For the preservation of cultural heritage lying in the contents of old and rare materials, which are either in a decaying stage or use of contents, the knowledge lying underneath old and rare books can be made accessible to the outside world.

Preservation of these items requires special efforts on the part of library staff as well as users. Some principles of conservation of digital resources in relation to preservation strategies, approaches to preserving electronics records are presented in this paper.

ACQUISITION, PRESERVATION AND RETRIEVAL OF DIGITAL RESOURCES: ROLE OF LIBRARY CONSORTIA

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ABSTRACT

With the advancement of Information and Communication Technologies (ICTs), today's libraries are moving towards acquiring digital resources. Unlike the traditional form, they do not require separate spaces in library to be stored rather they are hosted and stored in computer situated locally or remotely. At one hand, where the digital resources help us to find out information quickly and rightly, on the other hand, they had opened the doors for new problems in acquiring and preserving them. Here, the Library Consortia can play important role. This paper discusses the role and possibilities of Library Consortia helping in acquiring, preserving and retrieving Digital Resources.

1. INTRODUCTION

Today's every institution, right from the college up to universities are suffering from inadequate funding or stringent budget cuts, reduced staff and devaluation of rupee against major currencies and escalation in the cost of foreign publications. Due to this, there is a continuous reduction in the subscription to scholarly journals, which affects the research and academic activities. Now a days, various technologies are available for accessing information for the research community. Many of the journals and reference sources are available in digital formats, from which scholarly information can be obtained for research purposes.

2. DIGITAL RESOURCES

A digital resource can be defined as any resource, which is available in digitized form. They can include a variety of materials such as: (i) complete contents of document in machine readable form (ii) scanned images (iii) CD-ROMs (iv) databases access though Internet or other networks (v) metadata and digital audio/video clippings or full movies etc.

In the present age of information technology, the libraries are bound to procure them because of following reasons:

(i) Evolution and proliferation of information technology.
(ii) Changes in publishing trend - publishers are inclined towards electronic publishing.
(iii) Information explosion through improving digital technology, attempts can be made to achieve bibliographic control over important and useful conventional information sources in science and technology and even social sciences.
(iv) Financial constraints on the part of all kinds of libraries.
(v) Growing popularity of World Wide Web and overall realization of utility of electronic technology in every sphere of knowledge.
(vi) Tremendous growth of CD-ROM products etc.

3. SELECTION, ACQUISITION AND PRESERVATION OF DIGITAL RESOURCES

The selection and acquisition of digital resources is a tough task. In acquiring them in a library, the following points are to be kept in view:

(i) The conventional collection development criteria should be paramount and are to be applied consistently across formats including digital resources, which include:
- Establishing a coherent rationale for the acquisition of each resource.
- Meeting faculty and student information needs, and providing orderly access.
- Preparing guidelines to the digital resources and integrating them into library service programmes and;

- Ensuring that the advantages of the digital resources are significant enough to justify its selection in digital format.

(ii) The priority should be given to digital format acquisition of those resources, which are beneficial to most of the faculties and the students.

(iii) The priority should also be given to digital resources when they offer significant added value over print equivalent in such ways as: more timely availability, more extensive content and grater access.

(iv) A digital collection must contain a sufficient critical mass to evaluate its utility and to justify its selection.

Whereas, in selecting a digital resource for a library, following levels of review are to be seen.

(i) Is the content appropriate to the library mission?

(ii) Are the format and information delivery medium appropriate to the content and with the rationale for resources acquiring?

(iii) Is the acquisition practicable with in the existing budgetary, technical, legal and other constraints?

(iv) Are the resources compatible with the library's overall strategic digital library vision and current infrastructure?

As far as the preservation is concerned, it is ensuring the long-term access to the digital documents. Unlike the print publications, the digital preservation is more complex and many aspects are to be taken for consideration, such as contents, presentations, functionality and authenticity etc of the resources. It is advisable to keep following criteria in mind while going for digital preservation.

(i) Preservation of digital resources to be done at different levels depending on its usability and functionalities.

(ii) Continuous reviewing of the digital resources for ensuring long term access to them; and

(iii) Weeding out obsolete information and invalid websites, when access in online.

The preservation of digital resources is possible in following ways:

(i) The older technology can be preserved for viewing digital objects in their original formats but it is not feasible in long term due to cost, space and technical support requirements, e.g., the Hardware.

(ii) Some digital resources are highly dependent on particular hardware or software, for such resources, emulation techniques are used for long term access.

(iii) Data migration technique can also be sought which cover a wide range of activities to periodically copy, convert or transfer digital information from a medium that is becoming obsolete or physically deteriorating to a newer one (e.g., floppy disk to CD-ROM), and or converting form one format to another, and/or moving documents from one platform to another. Through migration the preservation of physical presence and the content of the digital object can certainly be done. However, it may not preserve presentation, functionality and the context.

In avoiding such duplication of efforts and resources, many libraries are now switching over to partnership, i.e., a kind of resource sharing of old aspect. This is what constitutes a library consortium. So, it would not be wiser or cost-effective to duplicate information resources among the libraries rather than to cooperative purchase option through consortia purchase and provide wide access to information resources over the Internet.

4. LIBRARY CONSORTIUM

As stated earlier, the digital resources in a library can be acquired as:

(i) By digitizing existing important and useful print materials, which also helps in preserving rare and fragile objects without denying access to those who wish to study them.

(ii) By adding in library catalogues, databases and networked resources, the links and pointer to resources, which are freely available on the Internet and are of significant scholarly value.

(iii) By purchasing or licensed material such as electronic journals or databases. In many cases, this material is not 'physically owned' by the library in the same sense

that printed book of journal is owned, but instead the library has acquired access rights to the materials on behalf of library's clientele.

Whatever the methods, we follow but it is not possible for each and every library to subscribe these items. To overcome the problem, Library consortium, the group of libraries coming together with common interest, is emerging as a new concept. Consortia have become important due to need of using funds most effectively and the changes taking place in the publishing industry. Due to proliferation of electronic journals, publishers can offer licensing agreements at favorable terms to consortia, which in turn, provide the opportunity to libraries in providing access to a wider range of titles to their clienteles. With the help of library consortia, the participating library would be able to achieve what the members of group cannot achieve individually. The consortia can play important role in acquiring licenses and sharing electronic resources by:

(i) Acting as a platform for promoting activities and programmes and in the area of electronic resource sharing.

(ii) Negotiating with major publishers for distribution of electronic journals and online bibliographic services on the basis of needs expressed by the libraries in the consortium. As a group, it can benefit while negotiating the price. The price of digital resources acquired through consortium may vary from consortia to consortia as it mainly depends on the negotiations between the two parties.

(iii) Keeping watch on upcoming latest technological changes in publishing industry and the associated legislations, which can affect the libraries directly or indirectly.

The degree of access and use permitted of an electronic journal or database heavily depends on the terms and conditions negotiated with the publishers of the electronic resources. The committee made for this purpose by the consortia does this all. There are some areas where there may be the chances of conflicts between the licensor and the library licensing a product. These are:

(i) There may be the chances of disagreements about authorized users, particularly for commercial research databases whose publishers have significant sales

outside of the traditional college and university community. There is certainly a potential for legal conflict if a company believes a library is ignoring authorized user definition and thereby costing the publisher significant revenues loss.

(ii) In case, when there is a third part right in accessing the e-resources, there are chances of facing the case of copyright violation and the responsibility of the misuse rests with the librarian.

(iii) While the third party liability seems unlikely it is conceivable that a user could use a library or its parent institution because of damages resulting from inaccurate data in database. Such lawsuits do occur over errors in software.

Keeping the above facts in consideration, a license agreement between the parties and the consortia on the behalf of the libraries participating in the consortia is made stating the definitions, choice of law, the rights granted under the license, usage restrictions, terms of termination, delivery and access to the licensed materials, license fee, license's fee from the participating libraries, implementations and evaluation, warranties, undertaking and indemnities etc. The participating libraries must take preventive measures for avoiding misuse or abuse by individual clients. However, license of purchaser agreement must not place liability on the licensing/purchasing institution or on consortia for the misuse of content or product by individual user.

During consortia purchase, the following precautions should be taken:

(i) Providers should not preclude libraries from working though consortia to seek advantages pricing or other special arrangements by writing contracts only with individual institution and not with consortia.

(ii) All terms and conditions should be negotiated and clearly stated in the contract. Hidden charge, after the fact retroactive charges, changes in the content, or any other changes in commitment are not acceptable without re-negotiation.

(iii) Non-disclosure language, if necessary, should not preclude library consortia from sharing pricing and to

other significant terms and conditions with other consortia.

The benefits of the purchasing e-resources through consortia are:

(i) It offers low – cost access to information.
(i) It promotes the rational use of funds.
(ii) It expands the readership of journals and other e-databases by allowing more users access.
(iv) The digital collections in the different digital libraries can complement each other for enhanced access.
(v) The cost of establishing the digital library can be decreased.
(vi) It ensures the continuous subscription to the periodicals subscribed.
(vii) It guarantees local storage of the information acquired for continuous use by present and future users.

5. TYPES OF CONSORTIA

Different groups throughout the world have formed various consortia. But there is no single model for consortium; however, various types of consortia may be observed on following points:

(i) From highly decentralized organization to highly centralized ones.
(ii) The degree of centralization of a consortium is the primary factor affecting not only how member institution interact each other, but also relationship with external part i.e., the publisher or vendor.
(iii) More decentralized the consortium, the grater the degree of autonomy each member retains.
(iv) Correlation between the amount of autonomy that the individual institution retains and the ability of the consortium to achieve set goals as a group.
(v) If the authority is highly centralized, the consortium is more likely to have dedicated staff to perform ongoing work.

5.1. Loosely Knit Federations

These possess following characteristic features:

(i) Local or Regional
(ii) Governed by its members

(iii) No central staff, no funding
(iv) Very flexible with no bargaining power
(v) With low common interest, no central authority, but limited or no group purchasing power.
(vi) Yields minimum return

5.2. Multi-type State Network

These are with following characteristic features:

(i) Statewide or multiple states
(ii) Low common interest
(iii) Central staff but no funding
(iv) Some what flexible
(v) Little bargaining power

5.3. Tightly Knit Federations

These possess following characteristic features:

(i) Statewide or single library
(ii) High common interest
(iii) May have sponsoring agency
(iv) Have action agenda
(v) Publisher discounts slightly high
(vi) Central staff with possible central funding
(vii) Fairly flexible with moderate bargaining power

5.4. Centrally Supported Consortia

These are with following characteristic features:

(i) Single rate
(ii) High common interest
(iii) Significant action agenda
(iv) Central staff and strong funding
(v) Moderately inflexible
(vi) Strong bargaining power

Many international and national consortia of various types as stated above are working in the field of library science. To name few on international level are: *Arizona University Libraries Consortium* (United States), *Consortium of Academic Libraries in Manchester* (United Kingdom), *Co-operative Action by Victorian Academic Libraries Limited* (Australia), *Illinois Library Computer*

Systems Organizations (United States), *Missouri Research Consortium of Libraries* (United States) and *Pennsylvania Academic Library Connection Initiative* (United States). As far as, the national level is concerned, some of important consortia are:

(i) *Science Direct-Elsevier*
(ii) *Gale Group-A Thmoson Company*
(iii) *Consortium for IITs and IIMs*
(iv) *J-Gate – the e-Journal Gateway and*
(v) *UGC-INFONET : E- Journals Consortium*

UGC – INFONET is the largest emerging library consortium, which is funded by the University Grants Commission and is being executed by INFLIBNET Centre, an Inter-University Centre of UGC at Ahemdabad. All universities come under the preview of UGC and are being covered under this consortium. This consortium is the result of better understanding and cooperation between the UGC and ERNET (Education and Research Network), the Inter – University Centres IUCAA, CEC, INFLIBNET and the national and international publishers.

The literature made available on this consortium includes, journals, covering research articles reviews and abstracting databases. The access to current as well as to archival literature is provided. This programme aims at covering all fields of learning of relevance to various universities including:

(i) Arts, Humanities and Social Sciences
(ii) Physical and Chemical Sciences
(iii) Life Sciences and
(iv) Computer Sciences, Mathematics and the Statistics etc.

At present, access to various E-journals has been started from First January 2004. There is planning to make available the access of e-journals in future to the colleges also in due course of time.

6. CONCLUSION

The academic and research community in the country mainly depends on the journals for their research work. The consortia have made available for the libraries what they could not achieved even spending their 75-80 % of the library budgets on journals and e-resources. Now the academic and research community will have access to resources of their interest through these initiatives.

But the full benefits of this facilities in the institutions is possible only when User-awareness Programme are organized at several places by the owners of these consortia to make and train the academic and scientific community in the use of electronic or digital resources.

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INFORMATION FLOW AND PRINT MEDIA: A STUDY OF LOCAL DAILIES IN MANIPUR

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ABSTRACT

Local dailies are important print media for recording, preserving and disseminating local information to the local people. A study was conducted during 2000-2003 in the state of Manipur regarding the said aspect. More than six hundred newspaper readers, a number of editors and librarians in the State were interviewed with structured questionnaire. The problems are identified for publication, preservation and dissemination of information related to local dailies. The findings are placed in tabular form. Two models are designed to improve the publication, preservation and dissemination. Andhra Pradesh model is referred. Some provisions of the Manipur IT policy 2003 are noted for designing one of the said models.

1. INTRODUCTION

In Manipur (see Annexure I) nearly forty local dailies are published currently. Except a very few all are two paged publications. Mostly are in vernacular, a very few is in English language and some are in tribal dialects. People of the state are in habit of reading dailies published from different places (not only from Manipur but from outside Manipur too). Most of the libraries of the state subscribe dailies (as per financial capacities) for the use of their communities and they have a sizable number of visitors for the

said purpose. But, as it has been observed that almost all the libraries are so far not able to (i) provide proper services for the current use of the dailies; and (ii) preserve them properly for the future use, because of poor infrastructure. It is further known that there has been a great demand for all kind of services related to the dailies for present and future use from all sections of the newspaper-users. The present paper is the outcome of one study made recently on the issue mentioned above. The objective on the present work is to find out some alternative so that the efficient and effective services in connection with the 'dailies' are available in the state.

2. METHODOLOGY

A survey (Sangeeta, 2004) has been conducted during April 2000-Dec. 2001 with the help of a structured questionnaire to examine (i) the role played by local dailies; and (ii) the services provided by the libraries of Manipur in dissemination of information. The structured questionnaires were distributed to different sections of the people such as:

a) Editors of the local dailies (94% out of 31 editors interviewed with questionnaire responded).

b) Readers of the local dailies(81 %out of 800 readers from different communities like students, teachers, other service holders crafts-men, business communities and unemployed persons residing in valley and hill districts of Manipur disclosed their views regarding availability of information from the local dailies and of library services for the said purposes).

c) Librarians (70 libraries including academic, special and public which are situated in and around Imphal were surveyed to record the views of the librarians in connection with newspaper-services).

3. MANIFESTATION

3.1 Newspaper-services in the state

In order to record the newspaper-services provided by the libraries of Manipur, it is necessary to know the views of the users/readers and the librarians of the state.

3.1.1 Readers' view on newspaper-services

In response to a set of questions, the sample population (readers) has expressed its views about some of the services provided by the libraries in connection with newspaper. A good number of respondents, particularly in valley districts visit libraries for reading newspaper. The experience of the valley people with library services on newspaper are however, slightly better than by the people in the hill districts as shown in the table 1. But due to inadequate library facility in the hill districts, the percentage of regular visitor in the library is very insignificant and is deprived of utilizing such facility.

Table-1 Views of the respondents about the role of libraries in newspaper-service (Percentage)

	Valley (N=398)		Hill (N=250)			
	Yes	No	N.R	Yes	No	N.R
Visiting libraries	43.2	50.5	6.3	18.4	43.6	38.0
Visiting everyday	20.6	23.9	55.5	3.2	58.8	38.0
Local dailies displayed	44.5	25.1	30.4	12.8	32.4	54.8
Old copies preserved	45.7	25.1	29.1	9.6	35.6	54.8
Old copies in bound form	40.7	26.6	32.4	7.2	38.0	54.8
News clipping service	18.1	47.7	34.2	0.0	45.2	54.8
Cooperation from lib. staff	53.3	16.3	30.4	25.2	20.0	54.8
Photocopy Service	27.9	37.9	34.2	7.2	38.0	54.8

Source: Questionnaire (N.R- Not Responded)

3.1.2 Librarians' view on newspaper-services

3.1.2.1 Nature of services provided

The nature of services provided by the libraries is highlighted in table 2. The present survey reveals that only 16 and 29 libraries are extending the newspaper clipping and reference services respectively. It is also observed that most of the libraries do not provide services like indexing, reprography and microfilming of newspapers required for any research work.

Table- 2 Nature of newspaper services (N= 70)

Nature of Services	No. of libraries (%)
Newspaper clipping	16 (23.0)
Newspaper indexing	-
Reference Service	29 (41.4)
Reprographic Service	01 (01.4)
Micro-filming service	-
Other	12 (17.1)
N.R.	12 (17.1)

Source: Questionnaire

3.1.2.2 Process of newspaper filing and arrangement of clipping file

Maintenance of newspaper is indispensable since the stock/ copies of the newspaper are difficult to locate, after the use of the readers. Therefore, the libraries are supposed to maintain the newspapers in a more methodical way to serve the present and future readers effectively and efficiently. It is observed that 52(74%) out of 70 libraries maintain the process of newspaper-filling in title wise and chronologically.

Table- 3 Process of newspaper-filing (N=70)

Process of filing	No. of Libraries (%)
Chronologically	14 (20.0)
Title wise	38 (54.3)
Subject wise	--
Region wise	--
N.Responded	18 (25.7)

Source: Questionnaire

3.1.2.3 Constraints for not providing newspaper-services

The librarians of the state have disclosed that they usually face a number of problems in order to carry out the newspaper-services efficiently for the users. They have admitted that, financial limitation, lack of co-operation from staff members, shortage of space, disinterested readers and lack of time are some of the causes which normally prevent them to provide newspaper-services to a handful interested readers. It is interesting to note that nearly 50% of the respondents prefer to remain silent in this matter.

Table- 4 Constraints for not providing newspaper-services (N=70)

Constraints	No. of Libraries (%)
Shortage of space	05(7.14)
Lack of co-operation from staff members	06(8.60)
Shortage of resources	01(1.43)
Lack of time	02(2.86)
Financial problem	08(11.43)
Readers not interested	04(5.71)
More than one constraints	14(20.0)
N. responded	30(42.9)

Source: Questionnaire

3.2 Proposal for a Newspaper Library (NPL)

As it is understood from the above discussion, the state is now in great need to have a separate ***NPL*** with proper infrastructure facilities. Therefore, it is proposed that the state must set up one separate ***NPL*** under its own umbrella (preferably under the Directorate of Libraries/Directorate of Arts and Culture). The proposed ***NPL*** is supposed to preserve not only local dailies on different languages but also regional, national, foreign dailies/weeklies on different subjects. The important functions of ***NPL*** involve collecting dailies/weeklies, scanning the copies, selecting the news items, cutting and arranging them by subject headings/classification schemes, pasting and filing them for current and future use, reformatting material for preservation and providing efficient services not only directly and physically but also indirectly and electronically. What people think regarding the setting up of a separate ***NPL*** in the state? Responding to this query, the editors, different sections of user-community and the librarians are all in positive note. Before forming final design let us go to this part.

3.2.1 Editors' Viewpoint

Since a good newspaper influences the mind of the people to a great extent, the editor has to play an important role in the organization of a newspaper by (i) organizing the news-items; (ii) disseminating them to the masses; and (iii) commenting on matters of public interest in a fair, accurate, unbiased, decent and responsible manner. In fact, the editor has to act as an effective medium for two-way communication between the readers and different organizations of the society.

The editors of the local dailies in the state admitted that their objective is to satisfy the information requirements of the people thereby disseminating information on various areas through different forms. Moreover, most of them (97%) have also felt the necessity of a separate NPL in the state for better information services. They interpreted that:

- the ***NPL*** can become a very important organ to the social development;
- the contribution of ***NPL*** to news making is very significant;
- it helps the editors/journalists in retrieving the required information quickly and provide access to information source required for background information for news stories; and
- it may support the researches in all fields to gather right information at right time.

3.2.2 Readers' Viewpoint

Newspaper is considered as one of the most popular reading material available in the library which provides current information to various types of users. But, most of the readers (as observed) found that the present system of library services in connection with newspapers is inadequate. Therefore, they need a separate ***NPL*** in the state elaborating their arguments as noted below. Establishment of a ***NPL*** is needed in order to:

- disseminate the right kind of information to all sections of the society;
- provide the opportunity for updating knowledge to those people who cannot subscribe to all the newspapers of the state/country;
- fulfill the requirement of the media persons/scholars who are not given proper services by the local information centers/libraries;

- help the young learners (for academic purposes), students, authors, research scholars, and politicians etc to get more information for their academic work;
- study the people movement and the policies of the Govt. past and present at a time; and
- Preserve the newspapers so that it will enable the scholars to trace old records regarding state, region, home and foreign countries.

3.2.3 Librarians' Viewpoint

The contribution of a librarian is very significant in rendering the newspaper-services to the users efficiently and effectively. However, it is not an easy task to maintain the copies systematically and provide the services to the users. As pointed out, the librarians of the state faced a lot of constraints in providing newspaper-services. However, they have admitted that the objectives of newspaper-services in the library will be fulfilling if there is a separate ***NPL*** in the state. They subscribed that establishing a ***NPL*** in the state is necessary in order to:

- sponsor reading-habit of the people;
- serve as ready reference service to the users;
- disseminate current and relevant information to all sections of the society;
- provide the opportunity to the economically backward users for reading and procuring required news items; and
- to support academic and research activities in the state.

3.2.4 The Andhra Network

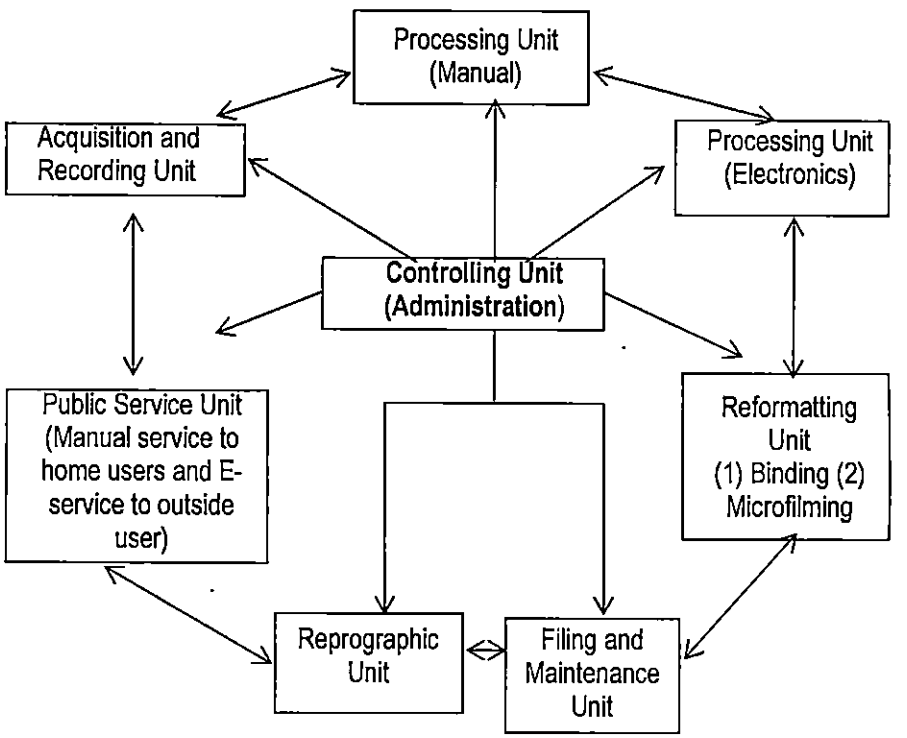
It may also be noted in this connection that the Andhra Pradesh Government (Government of Andhra Pradesh, 2000) has recently constituted a 'Committee' with the Chairman, Press Academy of Andhra Pradesh as Chairperson for 'supervision scrutiny and execution of the Research Centre to study and reserve old newspapers and magazines'. The Committee shall assist the Press Academy in (i) collecting information and data on the Telugu newspapers and periodicals available in various libraries and other sources in the state and outside; (ii) preserving them in digital imaging/microfilming/microfiche forms (iii) entering all or part of the records in the website/internet; (iv) making the record available to the journalists, students of journalism and researchers.

3.2.5 Designing Models

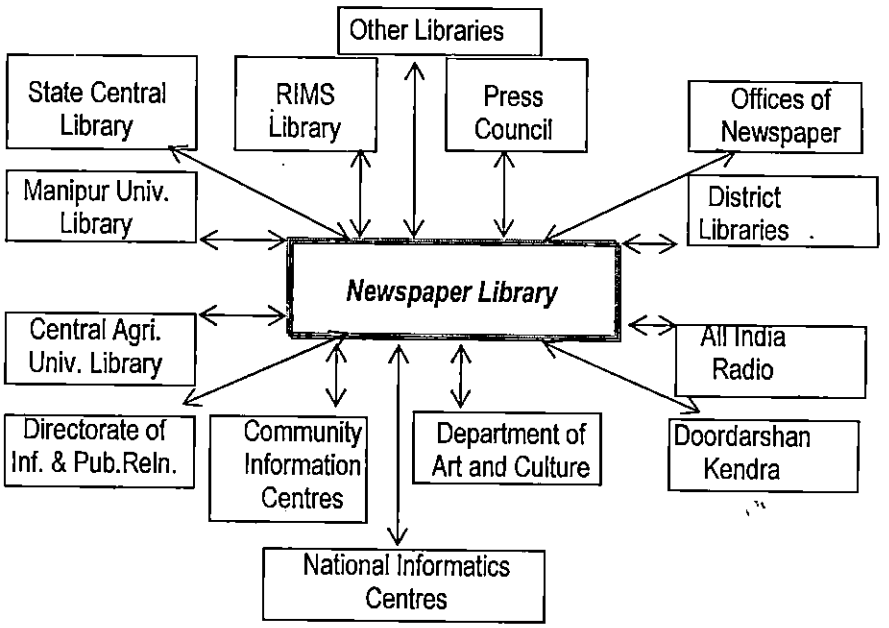
Two models of ***NPL*** are designed here based on the functions mentioned above.While 'Model-A' displays the functions of the ***NPL,*** 'Model-B' shows the roadmap for the dissemination of services/products to the people of various sections living in the state (following the 'Government to citizen ***i.e.***, G2C' concept and using the technology planned for 'State Wide Area Network' ***i.e.***, 'WAN' of Government of Manipur). It is, however, necessary to lay down the detail of economical-technical-electronically and other resources and sponsorship-matters with the consultation of an expert team.

Exhibit: Model of Proposed NPL

Model-A: Functions of Newspaper Library (NPL)



Model-B: Service Centres of Newspaper Library using 'State Wide Area Network' of Government of Manipur



Almost all widely circulated dailies have now 'websites'. Using such link, Internet edition/version of news contents can be accessed instantly. As web user the ***NPL*** must have Internet facilities. However, all the local dailies may not be able to have own 'website' because of limited circulation and financial capacity. It is necessary, therefore, to maintain such dailies either in original or in microfilm/reprographic form. Like profit making organization, the ***NPL*** can build its own resources through information-brokerage (***i.e.*** providing information against fee). It can also use the existing infrastructure of the Government of Manipur, set up as per its IT Policy 2003 under Electronic-Governance (e-G) and Government to Citizen (G2C) Interface concepts (as noted in Annexure II).

4. CONCLUSION

Editors of the dailies, readers/users of the dailies and keepers (librarians) of the dailies- all these three segments want (as observed above) a separate ***NPL*** for better service in connection with dailies. The readers and the librarians have also confirmed that the libraries in the state are not in position (i) to provide required newspaper-services to the readers for current use; and

(ii) to preserve and maintain these delicate items for future use. The ***NPL*** may be looked like a 'morgue' because of all the dead information it contains but it can be a living organ for providing information in case proper planning for preservation of newspaper is executed. It is expected that the active implementation of the proposed two designs under the supervision of the state government will meet the aspirations of the academic communities of the state.

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2. Government of Andhra Pradesh (2000). Library Today. 23 (4).

Annexure-I
Some facts about Manipur

Demography	Population (in lakh)
Area: 22,327sq.km Districts: 09(Hill- 05; Valley- 04) Towns: 33 Blocks: 31 Sub0divisions: 38 Village: 2212 Population Density (2001): 107/sq.km.	Total: 23.88 (SC- 2.02%, ST- 34.4%) Male: 12.07, Female: 11.81 Urban: 05.70, Rural: 18.18 Sex ratio(2001): 978:1000 Literacy (%) Total: 68.87(Male:77.87; Female: 59.70) Principal Language- Manipuri
Institutions	
Educational	
Primary Schools: 2572 Upper Primary: 730 High Schools: 529 Senior Sec. Schools: 76	Teacher Training Institute: 01 Polytechnics: 01 University: 02 Colleges: 50 Medical College: 01

Sources: (i) Census of India 2001(series 14); (ii) Selected Educational Statistics 2000-2001, Ministry of HRD, New Delhi, 2002

Annexure- II
IT Policy of GOM & Proposed NPL

1	'The State shall establish a 'backbone network' *i.e.* **Manipur State Wide Area Network (MAN-NET)** for voice, data and video transmission and dissemination. The network shall be utilized for inter department connectivity, multi-service facilities, file transfer facility, e-mail, online query and response etc. It will enable better communication and information sharing.' It shall be secure network for the State and will be through VSAT/leased/dedicated optical fiber cables/radio frequency links. The proposed ***NPL*** should be established under the umbrella of the State Government as done in Andhra Pradesh and should be a part of such e-programme.
2	'All public domain information would be digitized and make available for electronic access on the internet as well as in the form of CD media.' Information from local dailies are used by public and for public and, therefore, the ***NPL*** shall get such facilities.
3	'IT application in creation of data banks will be mandatory for all departments, corporation etc.' The ***NPL*** should be considered as one of such departments and IT facilities should be provided to it in creation of newspaper-data-bank (data base).
4	'Specific initiative will be taken for use of Manipuri in computers and developing web applications.' For the creation of database and website of/for Manipuri language local dailies, such opportunities should be provided to the ***NPL.***
5	'The state capital will be connected with the district towns, SDO/Block Offices by VSAT.' The ***NPL*** can be connected with the district and block libraries if same facility is extended.

Source: Souvenir, Manipur Information Technology Expo (MITEX) 2003. Imphal, ETE & DST. Government of Manipur

INFORMATION HANDLING USING WINISIS AND WWWISIS: A ON THE JOB EXPERIENCE AT G.R KARE COLLEGE OF LAW, GOA

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Abstract

The paper attempts to discuss a experience of informati handling in a special library dealing with single subject Law. The different types and sources of information are handled using DBMS software WINISIS and creating an interface using WWWISIS. Also a model with program code is provided with details of how to create the interface and make the Database searchable. What is the structure of the database for different types of information such as Books, Articles, CD's, Newspaper articles etc. access to information available on the Net by creating a Portal Cum the Library Website. This paper gives a very basic way to start the process of automation using free software and having international standards for data transfer as it can be converted and used as database for any other sophisticated automation software.

1. INTRODUCTION

Success in any professional filed today largely depends on access to professional information. Information, which helps then make critical decisions that, defines their performance and success. Law library is a special Library and the amount of information produced in the field of Law is very vast and everything is relevant in the eyes of Law. Be it latest technology in the field of IT that helps in dealing with Cyber Crimes to any minute sociological problems which, if not paid attention to may become a bigger issue and create an imbalance in the society. Thus the major criterion to be a good Lawyer is good knowledge of current awareness.

1.1 G.R. Kare College Library services

The following are a few Library services that are offered to the students and Teaching staff of the college.

(i) Current updates of the subject to the Teaching staff according to their profiles submitted to the library.
(ii) Research of precedent cases to Advocates and also Students participating in Moot Courts.
(iii) "Out reach Membership" – for practicing professionals in the locality
(iv) Search the Books Database via GOALNET
(v) Internet Search and compilation of articles on topics required for the research/ teaching/ studying in the form of a CD or Print form which ever is feasible.
(vi) New Arrivals of Books – in the form of a Notice
(vii) Case updates on day to day basis in the form of a file
(viii) Newspaper clipping services on Law as well as Light topics such as Health
(ix) Reprography
(x) Referral Services
(xi) Book ordering and selling on demand by students

2. THE PROCESS OF INFORMATION HANDLING USING WINISIS AND WWWISIS

Since it was too early for us to go in for total automation of the Library. A decision was taken to prepare Databases of Books, Journal Articles, Newspaper Clippings and CDs. The reason for choosing WINISIS were:

Major reasons were:

- There was no other option
- Free of cost
- Had the Knowledge of using this software
- Internationally used

Technical reasons:

- Has international standards and can be easily exchanged from one format to other to form a backend for any automation software
- Good information processing and retrieval technique
- A good search and display interface

- Unlike RDBMS no need to create a number of tables and then also see the connectivity between them. In one table you can put all the data and use sub field facility to input all related data.

2.1 WINISIS

WINISIS is a windows version of CDS/ISIS that allows you to build and manage structured non-numerical databases i.e. databases whose major constituent is Text. It offers the following features:

- Define databases containing the required data elements.
- Helps in updating the database that is – create new, edit existing, delete existing and update.
- Automatically build and maintain a Inverted/Fast access file that maximizes the retrieval speed
- Retrieve records by their contents, through a sophisticated search language
- Custom the display of records or portions of the same according to your requirements
- Sorting of the records by any sequence desired
- Print catalogues and indexes

2.2 WWWISIS

WWWISIS is a system developed and distributed by BIREME.PAHO/WHO, specially designed to act as a server for CDS/ISIS databases in a WWW client/server environment. It provides functions for searching and data entry operations over ISIS databases. WWWISIS operates as a server through the WWW Common Gateway Interface (CGI). The Actual operation is driven by parameters. Examples of parameters are- the input database name, a Boolean Search and an output format specification. A key feature its capability to dynamically generate its execution parameters, based on data sent to the CGI process from the WWW is presented in Fig. 1.

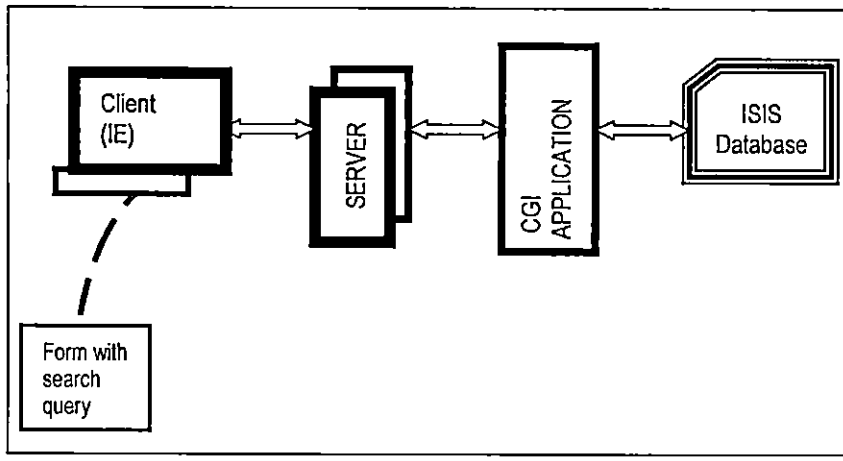


Fig. 1. Working of WWWISIS

In brief, the WWW browser (Client) collects the data through forms and sends the data to the WWW server, that calls the CGI-Application (Script/ Program) specified in the ACTION attribute of the FORM element. The CGI application sends its output to the WWW server that transfers it to the WWW browser. Thus client-server interchange of data usually repeats several times allowing interactivity between a user and a database.

2.2.1 Design and structure of the databases

The database was designed according to our requirements and also taking into considerations what are the access points they were later indexed word-by-word and line-by-line (technique 4 and 0 of WINISIS indexing techniques). The MARC Tags are used so that the Data communication can be done easily. The table 1 shows the structure of the different databases.

Table- 1 structure of different databases created

BOOKS		JOURNAL ARTICLES		CDS		NEWSPAPER	
Fields	MARC	Fields	MARC	Fields	MARC	Fields	MARC
ISBN	20	Journal Name	240	CD name	240	Filename	240
Author name	100	ISSN	022	Topic	241	Title of the Clipping	222
Corporate name	110	Title of the Article	241	Path	1	Author	100
Meeting Name	111	Author	100	Source	2	Source newspaper	242
Title	240	Publication (Vo. No. Issue No. Date of Publciation)	261	Subject	650	Date of publication	263
Edition	250	Subject	650	Accession no	910	Keywords	653
Imprint	260	Accession no	910			Accession No.	910
Series	440						
Contents	505						
Abstract	520						
Keywords	650						
Call No	900						
Accession No	910						
Date of Data Entry	1						
Remarks	2						

2.3 Installation of WWWISIS

The WWWISIS and its related programs can be downloaded form the ftp site:

ftp://ftp.bireme.br/wwwisis/pc/windows

The following programs should be downloaded and saved in cgi-bin folder of Apache folder. (C:\progra~1\Apache~1\Apache2\cgi-bin\...)

Wwwi32 : the main program to run the web interface
loadiso.bat : the batch file to generate master and cross reference file form the ISO format file of the given data base.
fullinv.bat : the batch file to generate inverted files
ifload.exe : used by the fullinv.bat file
mx.exe : used by loadiso.sh and fullinv.bat

2.3.1 Generating Database Files

In order to generate a database file for the WWWISIS interface use the following command on the command prompt.

Copy \winisis\data\books.*
\program~1\apache~1\apache2\cgi-bin
This command will copy all the required files from the WINISIS data directory to Apaches cgi-bin directory.

2.5.2. Setting up of WWWISIS Interface for the Books database

- An '*index.html*' as the first interface should be placed in '\Apache2\htdocs'. (see Appendix and fig 2.)
- A program which is called from the above file called as '*search.bat*', it is used with 'ACTION' of 'FORM' tag in the index.html file and is saved in the cgi-bin directory. (see Appendix)
- A '*search.cgi*' file to present the various options for the '*wwwi32*' command used in '*search.bat*' file. The '*search.cgi*' in turn refers to various other files. (See Appendix)
- A '*head.pft*' file (see Appendix)
- A '*books.pft*' file (Refer Appendix)
- A '*tail.pft*' file (Refer Appendix)

All the above files should be in cgi-bin directory of Apache folder, except the "*index.html*' file. (see fig 3 for display of search results)

Similarly for other databases the respective cgi and html files have been created. The option of choosing a database is provided in the index page and they and accordingly the respectively interface page is called and thus the transactions take place accordingly.

3. Design of a Law portal cum Library web page developed

The portal /Library Webpage provides the following information:

- Search the Local Databases (Our collection- Books, Journal Articles....)
- Search other college Databases via GOALNET
- Search Online Databases (e.g. Supremecourtonline.com)
- Basics of Law
- Online Journals
- Bare Acts

- Legal Maxims/ Legal Dictionaries
- Cause List of Courts in Goa
- Latest Issues Subject Wise
- Helpline (legal Consultants)
- New Arrivals in the Library
- Document Delivery on the Net
- Case Updates and latest Judicial Decisions
- Discussion Forums
- Moot Court Activities
- Legal Aid Camps (Schedules/ Programmes)
- Alumni (Resumes of Ex-students)
- Visitors to the Library
- Research Team
- Inter- Library –Loan
- Online Book Vendors
- Ask the Librarian

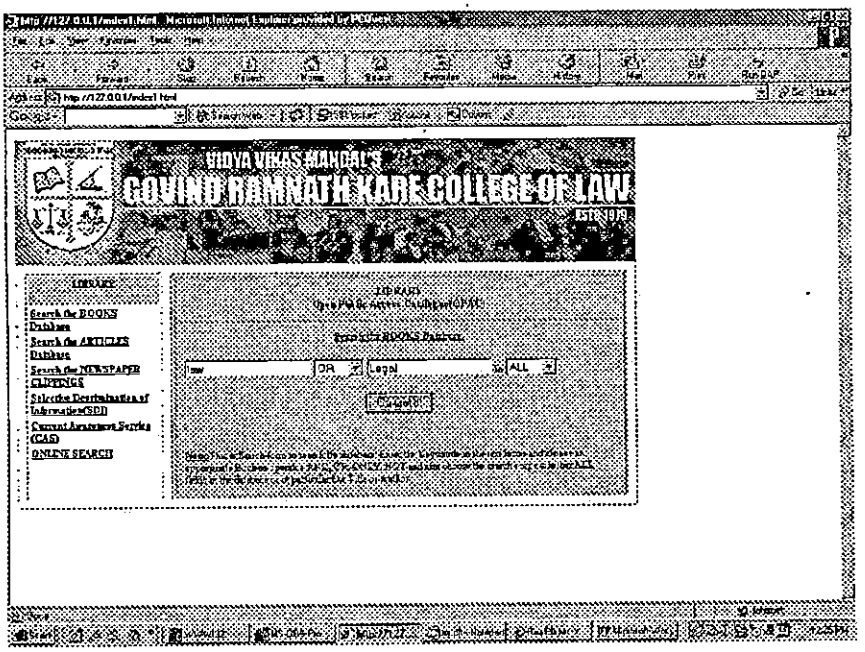


Fig 2. Index1.html: First interface page showing a query form to search Books database

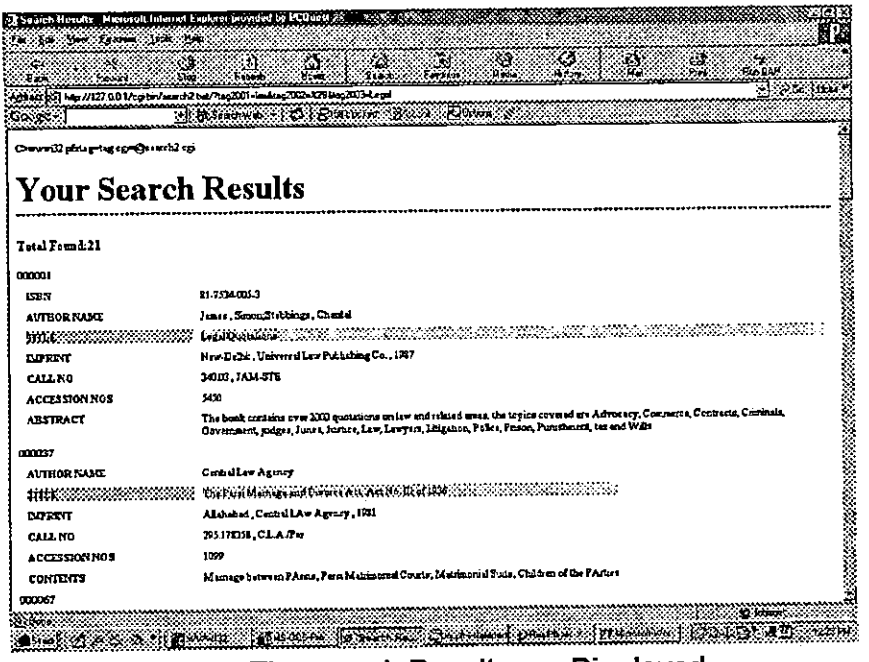


Fig 3. The search Results are Displayed

4. CONCLUSION

As the saying goes, *"it is better to light the candle then curse the darkness".* The attempt is been made in spite of uncomfortable conditions towards first step in automation process that is a good Database creation. Believing that there is nothing called as a perfect start and using what is available free and is having standards. As CDS/ISIS helps in easy data conversion from one format to another thus it does not matter which automation software we may go for in future. As the aim of our Institution in the field of Legal Education is to bring out good and skilled Lawyers, Information plays a vital role and in turn information handling is necessary to reach the right information to the right user at the right time in the right form.

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CDS/ISIS for windows: reference manual: version 1. <ftp://ftp.bireme.br/wwwisis/doc/wwwisis12.doc>

Sahoo, B.B., and Prasad, A.R.D. (2003). "A tutorial on WWWISIS", from 'Workshop on Digital Libraries: theory and Practice', Bangalore: DRTC.

WWWISIS: a world-wide web server for ISIS database version 3.0. <ftp://ftp.bireme.br/winisis/cds.zip>.

Appendix

Index.html Listing of the code

```
<HTML>
<BODY>
<img src="head.gif"><br>
<TABLE border="1"cellspacing="10" width="750">
<TR>
<TD valign="top" width="200">
<TABLE border="0">
<TR>
<Td bgcolor="#ABBBF7" ALIGN="center" VALIGN="top">
<b>LIBRARY</b>
<hr>
</font>
</TD>
</tr>
<tr>
<Td bgcolor="white" ALIGN="Left" VALIGN="top">
<a href="searchbooks.html">
<b>Search the BOOKS Database</b></a>
</font>
</TD>
</TR>

<tr>
<Td bgcolor="white" ALIGN="Left" VALIGN="top">
<a href="searcharticles.html">
<b>Search the ARTICLES Database</b></a>
</font>
</TD>
</TR>
<tr>
<TD bgcolor="white" ALIGN="Left" VALIGN="top">
<a href="searchnews.html">
<b>Search the NEWSPAPER CLIPPINGS</b></a>
</font>
</TD>
</TR>
<tr>
<TD bgcolor="white" ALIGN="Left" VALIGN="top">
<a href="sdi.html">
<b>Selective Dessimination of Information(SDI)</b></a>
</font>
</TD>
```

```
</TR>
<tr>
<TD bgcolor="white" ALIGN="Left" VALIGN="top">
<a href="cas.html">
<b>Current Awareness Service(CAS)</b></a>
</font>
</TD>
</TR>
<tr>
<TD bgcolor="white" ALIGN="Left" VALIGN="top">
<a href="online.html">
<b>ONLINE SEARCH</b></a>
</font>
</TD>
</TR>
</TABLE>
</TD>
<TD VALIGN="TOP" width="550">
<table BORDER="1" bgcolor="#ABBBF7" cellpadding="10"
width="550">
<TR>
<TD>
<CENTER>
<b><font size="4">
LIBRARY<BR>
Open Public Access Catalogue(OPAC)
</font>
</CENTER>
</TD>
</TR>
<TD border="2">
<CENTER>
<b><font size="3" color="#0A31AE"><u>
Search the BOOKS Database,</b></u>
</font>
</CENTER><br>
<form method="get" action="/cgi-bin/search.bat/">
<p><input type="text" name="tag2001" value=""size="20">
<select name="tag2002" size="1">
    <option value="*">AND</option>
    <option value="+">OR</option>
    <option value="~">NOT</option>
    <option value="">ONLY</option>
</select>
<input type="text" name="tag2003" value=""size="20">
```

```
In
<select size="1">
    <option value="">ALL</option>
    <option value="24">Title</option>
    <option value="70">Author</option>
</select>
<p>
<center>
<input type="submit" value="Go Get It!">
</form>
</TD>
</TR>
<tr>
<td>
<b><u>Note:</u></b>This is Search form to search the database.
Enter the Keywords in the text boxes and choose an appropriate
Boolean operator-AND, OR, ONLY, NOT and also choose the
search scope whether ALL fields in the database or in particular
like Title or Author
</td>
</tr>
</table>
</td>
</tr>
</table>
</body>
</html>
```

search.bat

```
wwwi32 pfxtag=tag cgi=@search.cgi
```

search.cgi

```
'db=kare'/
'bool=',
(
if p(v2001) then v2001 fi,
if p(v2002) then v2002 fi,
if p(v2003) then v2003 fi,
)/
'prolog=@head.pft'/
'pft=@books.pft'/
'epilog=@tail.pft'/
```

head.pft

```
'<html>'/
'<title>Search Results</title>'/
'<body>'/
```

```
'<p>'/
'<font size="10" color="#000099">'/
'<b>'/
'Your Search Results'/
'</font>'/
'<hr>'/
```

books.pft

```
if val(v1001)=1 then '<h3><b>Total Found:', v1002,'</b></h3>' fi/
'<table border=0 CELLPADDING=0 CELLSPACING=10>'/
mhl, mfn
if p(v20) then "<tr><td width=200><b>ISBN </b></td><td>", v20,
'</td></tr>'/ fi,
if p(v100) then "<tr><td width=200><b>AUTHOR NAME
</b></td><td>", v100+|;|, </td></tr>'/ fi,
if p(v110) then "<tr><td width=200><b>CORPORATE NAME
</b></td><td>", v110+|;|' '</td></tr>'/ fi,
if p(v111) then "<tr><td width=200><b>MEETING NAME
</b></td><td>", v111, '</td></tr>'/ fi,
if p(v240) then "<tr><td bgcolor=#abbbf7><b>TITLE </b></td><td
BGCOLOR=#F6EEBA>", v240, '</td></tr>'/ fi,
if p(v250) then "<tr><td width=200><b>EDITION </b></td><td>",
v250, '</td></tr>'/ fi,
if p(v260) then "<tr><td width=200><b>IMPRINT </b></td><td>",
v260, '</td></tr>'/ fi,
if p(v440) then "<tr><td width=200><b>SERIES </b></td><td>",
v440, '</td></tr>'/ fi,
if p(v900) then "<tr><td width=200><b>CALL NO </b></td><td>",
v900, '</td></tr>'/ fi,
if p(v910) then "<tr><td width=200><b>ACCESSION NOS
</b></td><td>", v910+|; |, '</td></tr>'/ fi,
if p(v505) then "<tr><td VALIGN=top><b>CONTENTS
</b></td><td>", v505(10,10)+|; |,
'</td></tr>'/ fi,
if p(v520) then "<tr><td valign=top><b>ABSTRACT
</b></td><td>", v520(10,10)'</td></tr>'/ fi,
'</table>'/
```

tail.pft

```
if (v1091='7') then 'No----- Records Retrieved' fi,/
if (v1091='0') then 'END OF SEARCH RESULTS', fi,/
```

TRANSFORMATION OF GOVERNMENT SCHOOL LIBRARIES OF DELHI ADMINISTRATION FROM STORE ROOM TO DIGITAL LIBRARIES: A PROPOSED MODEL

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ABSTRACT

This paper highlights the need of transformation of Government school libraries of the Directorate of Education of Delhi Government from storerooms to a Automated library .It further underlines on the importance of a Digital Library for Government school. This paper throws light on the place of a library in school, present position of libraries in Government schools and the present acquisition policy adopted in Government school libraries, how they can get benefited by using Internet and Intra-Net based technology in Government school Libraries and explain how Digitization can be useful in Government school libraries. How the ever-increasing information needs of the users of Government school libraries can be met by using Digitization. At the end of the paper a model is proposed for Government school libraries for making the school libraries truly Digital libraries.

PROPOSED PLAN FOR CREATION OF DIGITAL LIBRARY OF PROCEEDING OF UTTARANCHAL LEGISLATIVE ASSEMBLY

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ABSTRACT

In the modern democracies, the members of the Legislature have to play multifarious roles and, therefore, they require a wide variety of information to keep them abreast of the latest happenings both in local society and also outside it. Though we cannot even think to go to the level of Library of Congress, still Vidhan Sabha Library of Uttaranchal tries to fulfill the information requirement of the Uttaranchal Vidhan Sabha to the maximum extent possible. State of Uttaranchal was carved out of the Uttar Pradesh vide U.P. State Reorganization Act 2000 of Parliament on 9th November 2000. As per the Act the Vidhan Sabha will have 70 members and comprised 13 districts of erstwhile State of Uttar Pradesh. The City of Dehradun was selected as the temporary Capital of Uttaranchal and, therefore, the Vidhan Sabha Library was also established in Vidhan Sabha Complex in Dehradun.

In Indian democratic system, state assembly is an apex organization where issues related to citizens are discussed and debated by politicians, ministers, and leaders. Since these decisions debates are directly related to the life of people, therefore general public policy executors, decision makers may have keen interest to know them. Assembly Secretariat brings out these debates, decisions in the form of printed book, for the purpose of distribution/dissemination. Library also procures copy of it for retrospective and current use. This is the source, which provides authentic information related to the house activities and decisions. Since it is published document by Legislative Assembly, its copy right and other content and intellectual property rights are with Assembly. Library with the permission of Authorities can develop a Proceeding Digital Library. This paper covers the detail of requirement proposed digital library of proceedings of Uttaranchal Legislative Assembly.

FROM USER EDUCATION TO INFORMATION LITERACY: AN ANALYSIS OF CHANGE IN INDIAN CONTEXT

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ABSTRACT

Information is an essential need of all human endeavors in a complex society. It improves the quality of man, which helps in improvement of mankind's social, economic, cultural, scientific and technological as well as development a country and the world. For this it is foreseeable for the library and information professionals to provide right information to the right user at the right time.

The user is the last recipient of the information in the channel of communication process executed by the libraries and information centers. In this communication process each library should have sufficient collection, collection should have been arranged in a systematic manner so it can be retrieved and be disseminated at the right time, and for providing right information at the right time library should have competent and experienced staff, so that they can provide information services effectively and efficiently. The education and training of their users is an important factor in insuring effective and efficient information service.

This paper focused on various definitions of Information Literacy, and how it evolved from user education to information literacy. This paper also presents the area, characteristics and types, scope of information literacy. It examines the various information literacy programmes launched in the various countries to help out their valuable users. The paper presents the status of information literacy programme in India with reference to the problems in launching a National Information Literacy Programme (NILIP) in India, and some suggestions have also been made to achieve the advantages of information literacy programme. The study is based on real data collected through primary information sources i.e. questionnaire and personal interview.

USE OF ELECTRONIC RESOURCES BY FACULTY MEMBERS IN B.I.E.T, DAVANAGERE : A SURVEY

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and

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U. B. D. T. College of Engineering
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ABSTRACT

Evaluate the use of Bapuju Institute of Engineering and Technology (BIET) college library in Davanagere (Karnataka). A survey of 60 faculty members is conducted through a questionnaire. The analysis of the collected data covers the use of Electronic resources and how the electronic resources are improving the academic carrier of the faculty and also what are the problems that are faced in using the electronic resources. This concludes that the main intention of the use of electronic resources has been the academic interest of the users.

1. INTRODUCTION

With advancement of technology the libraries are moving towards digital resources, which are found to be less expensive and more helpful for easy access. These are helpful especially to distant learners who have limited time to access the libraries from out side by dial up access by the commonly available electronic resources mainly CD-ROMs, or OPACs, and Internet etc., which are replacing the print media.

1.1 B.I.E.T.

The Karnataka state has more than 110 Engineering colleges including Government, Aided, Unaided and University constituent colleges. The BIET is one of the prestigious colleges established

during the academic year 1979-80. The initiation and foresight of the members of Bapuji Educational Association Davanagere is responsible to build this institute both outside and inside. The institute has 12 under graduate and 5 post-graduate programmes in engineering, technology and management. Research activities were also under taken in all the departments in this institution. This institute is having faculty strength of over 140. The BIET library has 31,217 volumes, 210 Indian & foreign Journals, DELNET database searching and Internet facilities are available in this library.

1.2 Scope of the study

The study is confined to the faculty members of BIET College, Davanagere regarding the use of electronic resources. Its aim is to fulfill the academic needs of the faculty members and it covers Electronic Resources namely CD-ROMs, OPACs, E-books and e-journals and Internet etc.

1.3 Objectives of the study

(i) To know the availability of different types of electronic resources in BIET library.

(ii) To study the use of different types of electronic resources by the faculty members.

(iii) To study the purpose and utilization of the electronic resources by the faculty members.

(iv) To find out the hindrances faced by the faculty members while accessing and using electronic resources.

(v) To observe the impact of electronic resources over the traditional one.

(vi) To suggest suitable recommendations to improve the electronic resources and services for the benefit of faculty members.

1.3 Methodology

A questionnaire consisting of 13 questions was designed to elicit the opinion of the faculty members. These were distributed among the faculty members and the required data was collected which was further supplemented by informal discussions with the faculty. The analysis and interpretation of the data is presented in the subsequent sections.

2. ANALYSIS OF DATA

2.1 Qualification wise distribution of respondents

Table 1 indicates that, the majority (50.00%) of the respondents are postgraduates in Technology and 18.33% of the respondents are Bachelors degree holders in Engineering. At the same time 15.00% of the faculty members are postgraduates with PhD degree followed by 8.33% of the faculty members are Master degree holders.

Table - 1 Qualification wise distribution of respondents

Qualification(s)	No. of responses	Percentage
M.Tech	30	50.00
B.E.	11	18.33
M.Sc. Ph.D.	9	15.00
M.E.	5	8.33
M.Sc	5	8.33
Total	60	100.00

2.1.1 Sex wise distribution of faculty members

Table 2 reveals that 73.33% of male faculty members are working in BIET whereas, only 26.67% of female faculty members are earning their livelihood in this profession. This is a glaring example of sex-ratio imbalance of working community.

Table - 2 Sex wise distribution of faculty members

Sex	No. of responses	Percentage
Male	44	73.33
Female	16	26.67
Total	60	100.00

2.1.2 Teaching experience of faculty members

Table 3 shows that, only 10.00% of the faculty members have more than 25 years of experience in teaching and at the same tune 26.66% of the faculty members have 5-10 years of teaching experience, followed by 21.66% of faculty members have less than 5 years of teaching experience whereas, 13.33% of

respondents have 10-15 and 20-25 years of teachu1g experience respectively.

Table - 3 Teaching experience of faculty members

Experience in years	No. of responses	Percentage
0-5	13	21.66
5-10	16	26.66
10-15	8	13.33
15-20	9	15.00
20-25	8	13.33
Above 25	6	10.00
Total	60	100

2.1.3 Designation-wise distribution of faculty members

The Designation-wise distribution of respondents is shown in Table 4. 44 (73.33%) of the respondents are Lecturers, followed by 10 (16.67%) of the respondents are Assistant professors and only 10.00% are professors working in this college.

Table - 4 Designation-wise distribution of faculty members

Designation	No. of responses	Percentage
Lecturer	44	73.33
Assistant Professor	10	16.67
Professor	6	10.00
Total	60	100.00

The study reveals that, the majority (96.67%) of the respondents have agreed that, the electronic resources are available in the library. Less percentage of faculty members (3.33%) are not aware of the availability of electronic resources in their own college library.

2.1.4 Frequency of using electronic resources by faculty members

The following table 5 shows that, out of 60 respondents 16 (26.67%) of the faculty members are using electronic resources 'Once in a week', followed by 15 (25.00%) are using 'Daily', whereas, 18.33% of faculty members are using 'Occasionally' and

only 5.00% are 'Never' using the electronic resources in the library.

Table - 5 Frequency of using electronic resources by faculty members

Frequency	No. of responses	Percentage
Daily	15	25.00
2-3 times in a day	6	10.00
Once in a week	16	26.67
Once in a month	9	15.00
Occasionally	11	18.33
Never	3	5.00
Total	60	100.00

2.1.5. Purpose of using Electronic Resources

Table 6 reveals that, Majority 60 (35.09%) of faculty members are using electronic resources 'for finding relevant information in their specialization', followed by 20.47% of members are using for their 'research purpose'. Whereas, 19.88% are using 'to gain current and general information', and less percentage (7.60%) of faculty members are using 'for communication purpose'.

Table - 6 Purpose of using Electronic Resources

Purpose	No. of responses	Percentage
For research work	35	20.47
For communication	13	7.60
For finding relevant information in my specialization	60	35.09
Update the subject knowledge and general knowledge	29	16.96
To gain current and general information	34	19.88
Teaching purpose	171	100.00

* It is a multiple choice question so percentage cannot be rounded after 100.

2.1.6. Use of electronic resources by faculty members

Table 7 shows Frequency of use of electronic resources by the faculty members. Majority 55 (42.64%) of the faculties are using 'Internet', followed by 30 (23.26%) are using 'CD-ROM' and 13.95% are using 'E-Journals', however 4 (3.10%) of respondents are using or OPAC system.

Table - 7 Use of electronic resources by faculty members

Type of electronic resources	No. of responses	Percentage
CD-ROMs	30	23.26
Internet	55	42.64
OPAC	4	3.10
Online Database	10	7.75
E-journals	18	13.95
E-books	12	9.30
Any others	00	00
Total	129	100.00

* It is a multiple choice question so percentage cannot be rounded after 100.

2.1.7 Learned to electronic resources

Table 8 shows that, the most popular method of acquiring the necessary skill to use electronic resources. 27 (33.33 %) respondents are taking 'Guidance from Library staff'. While, 24 (29.63%) respondents learned through 'Trial and error' method, 13 (16.05%) respondents learned with the help of 'Computer department staff' and 10 (12.35%) respondents learned from 'External courses'.

Table - 8 Learned to electronic resource

Learned to electronic resources	No. of responses	Percentage
Trial and error	24	29.63
Guidance from the Library staff	27	33.33
Course offered by the Institutions	6	7.41
Guidance from the Computer staff	13	16.05

External courses	10	12.35
Any other (please specify)	1	1.23
Total	81	100.00

2.1.8 Adequacy of information in electronic resources

Table 9 shows that, 31(51.67%) of the respondents indicate that, the information available in the electronic resources is 'Always' adequate followed by 29(45.00%) indicate 'some time' and 2(3.33%) of respondents felt that, the information available in the electronic resources is 'never adequate'.

Table - 9 Adequacy of information in electronic resources

Opinion	No. of respondents	Percentage
Always	31	51.67
Some time	27	45.00
Never	2	3.33
Total	60	100.00

2.1.9 Hindrances in accessing Electronic resources

Table 10 shows the opinion regarding hindrances in accessing the electronic resources. Majority 22 (27.85 %) of respondents stated that, 'too much information is retrieved' is the main barrier to use electronic resources, followed by 20 (25.32%) opined that, 'time consuming' and 18 (22.78%) felt that 'lack of IT knowledge to effectively utilize the services' and 12 (15.19%) respondents stated that, 'limited access to computers' is the main barrier to use electronic resources.

Table - 10 Hindrances in accessing Electronic resources

Hindrance	No. of responses	Percentage
Too much information is retrieved	22	27.85
Time consuming	20	25.32
Lack of IT knowledge to effectively utilize the services	18	22.78
Using electronic resources often	7	8.86

distracts from doing work		
Limited access to Computers	12	15.19
Any other (please specify)	00	
Total	79	100.00

* It is a multiple choice question so percentage cannot be rounded after 100

2.1.10 Impact of electronic resources on academic carrier

Table 11 shows that, 42 (30.65%) of respondents stated 'access to a current up to date information' is a benefit of using electronic resources. Similarly 34 (24.81%) expressed 'faster access to information' is the advantage and 32 (23.35%) indicate 'easier access to information' is the benefit to develop the academic carrier of the faculty members.

Table - 11 Impact of electronic resources on academic carrier

Category	No. of responses	Percentage
Access to a current up-to-date information	42	30.65
Easier access to information	32	23.35
Faster access to information	34	24.81
Access to a wider range of information	29	21.16
Any other (Please Specify)	00	00
Total	137	100.00

* It is a multiple choice question so percentage cannot be rounded after 100.

2.1.11 Problems faced while using electronic resources

Table 12 Shows that, 21 (23.33%) of respondents have faced problem of 'lack of timing', followed by 19 (21.11 %) of faculty members indicate 'lack of training' is the main problem while using electronic resources. 10 (11.11 %) and 16 (17.78%) of faculties are facing 'lack of hardware and software' problems respectively.

Table - 12 Problems faced while using electronic resources

Problems	No. of responses	Percentage
Lack of Hardware	10	11.11
Lack of Software	16	17.78
Lack of training	19	21.11
Lack of information on electronic resources	16	17.78
Lack of operating funds	8	8.89
Lack of timing	21	23.33
Total	90	100.00

2.1.12. Success rate of finding required information in electronic resources

The respondents were requested to indicate the success rate in finding required information in electronic resources. Table 13 shows that, 24 (40.00%) of respondents were succeeded in the range of 75-99, followed by 20 (33.33%) respondents were succeeded in the range of 50-74 and least percentage (10.00%) of faculties were succeeded in the range of 'less than 25%.

Table - 13 Success rate

Success rate	No. of respondents	Percentage
100%	00	0.00
75-99%	24	40.00
50-74%	20	33.33
25-49%	10	16.67
Less than 25%	6	10.00
Total	60	100.00

2.1.13. Faculty opinion regarding features of electronic resources as a source for their academic work.

Table 14 shows that, the respondents are rating the features of electronic sources for their academic work. Average 3.00% of the faculty members have expressed the features of electronic resources which are available in the college library are 'good' except usefulness (3.58 %).

Table - 14 Faculty opinion regarding features of electronic resources as a source for their academic work

Features	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT	AVERAGE
Accessibility	1 (1.67)	9 (15.00)	29 (48.33)	17 (28.33)	4 (6.67)	3.23
Accuracy	3 (5.00)	8 (13.33)	27 (45.00)	16 (26.67)	6 (10.00)	3.23
Availability	2 (3.33)	6 (10.00)	34 (56.67)	12 (20.00)	6 (10.00)	3.23
Consistency	2 (3.33)	7 (11.67)	37 (61.67)	12 (20.00)	2 (3.33)	3.08
Ease of use	2 (3.33)	6 (10.00)	37 (61.67)	14 (23.33)	1 (1.67)	3.10
Flexibility	1 (1.67)	9 (15.00)	33 (55.00)	12 (20.00)	5 (8.33)	3.18
Permanence	1 (1.67)	11 (18.33)	32 (53.33)	10 (16.67)	6 (10.00)	3.15
Timeliness	2 (3.33)	17 (28.33)	25 (41.67)	13 (21.67)	3 (5.00)	2.95
Uniqueness	1 (1.67)	12 (20.00)	28 (46.67)	17 (3.33)	2 (3.33)	3.12
Usefulness	0 (0.00)	4 (6.67)	26 (43.33)	35 (35.00)	9 (15.00)	3.58

Note: Figures in the parenthesis represents percentages.

3. FINDINGS OF THE STUDY

(i) Only 10.00% of the faculty members have more than 25 years of experience in teaching.

(ii) Majority of respondents (26.67%) are using electronic resources 'Once in a week', and 35.09% of faculty members are using electronic resources 'for finding relevant information in their specialization'.

(iii) Majority 55(42.64%) of the respondents use Internet and 30 (23.26%) use 'CD-ROMs'. While using 27 (33.33%) respondents are taking 'Guidance from Library staff' regarding the use of electronic resources.

(iv) Majority 31 (51.67%) of the respondents indicate that, the information available in the electronic resources is 'Always' adequate.

(v) Regarding the hindrance of accessing the electronic resources, majority 22 (27.85%) of respondents stated that, 'too much information retrieved' is the main barrier to use electronic resources.

(vi) Majority 42 (30.66%) of respondents stated 'access to a current up to date information' as a benefit of using electronic resources.

(vii) Majority of 21 (23.33%) respondents have faced problem of 'lack of tuning', and 19 (21.11 %) faculty members indicate 'lack of training' is the main problem while using electronic resources.

(viii) Regarding the success rate of finding the required information in electronic resources. 24 (40.00%) of faculties were rating that; they have succeeded in the range of75-99.

4. SUGGESTIONS

Based on the finding of the study the following suggestions are recommended to improve the use of electronic resources among the faculty members.

(i) The authority must conduct training programmes for faculty members regarding how to use the electronic resources effectively.

(ii) Awareness should be created to use e-journals and e-books to obtain current information.

(iii) More computer/terminals should be installed in the library for the benefit of the faculty members.

(iv) More funds should be given to acquire the electronic resources.

5. CONCLUSION

The Electronic resources are played a vital role hl all the field of human life. These have rapidly changed the way of seeking and disseminating information. It is clear from the study that, the faculty members of BIET College have developed their academic carrier. The speed of availability and the ease of accessibility of information make the faculty members to use electronic resources more frequently. This study helps the librarian to know the importance of electronic resources in academic environment.

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A POLICY FOR INSTITUTIONAL REPOSITORIES AND OPEN ARCHIVES INITIATIVE - PROTOCOL FOR METADATA HARVESTING

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ABSTRACT

The article outlines the overview of Institutional Repositories and Open Archives Initiative- Protocol for Metadata Harvesting (OAI-PMH). Large numbers of open source software (Dspace, Eprint, Fedora, CDSware etc.) are available and can be downloaded for running Institutional Repositories. These software are OAI complaint and requires no royalty or fee. This article does not aim to describe the OAI-PMH in full but describes about the features of the protocol and software used for repository. A growing number of universities across the globe are running institutional digital repositories projects using open source software, while many others are in the planning stages. The specific requirements for repositories are still being defined and existing software is only just beginning to attempt to fulfill these needs. With respect to the application of digital preservation in institutional repositories, current implementations are at an early stage, but understanding of the problem and the solutions to address it are advancing rapidly. This makes the subject of Institutional Repositories in the context of digital preservation an important area for librarians and policy makers. Institutional Repository is a digital collection of a university's intellectual output. Institutional repositories centralize, preserve, and make accessible the knowledge generated by academic institutions. In India; IISC, DTRC, INFLIBNET and few other have explored the benefits of

open source software for achieving the contents produced by their faculty members. The paper also highlights the development of Institutional Repository and reason their of. Major factor for establishing IR are high cost of scholarly journals, preservation and open access movement. Further successful development of a repository requires a good policy. The paper described important issues regarding IR policy, open source software, standard and protocol

1. INTRODUCTION

In today's world of abundant electronic resources and vast bandwidth, forward-thinking librarians are collaborating to harness the potential of digital information and technology to provide better service to their users. They are forming consortium and exploring the benefits of open source software for setting up of E-achieves. Universities are developing institutional digital repositories of the research performed by their faculty and graduate students. The specific requirements for repositories are still being defined and it varies from institute to institute. The existing software is only just beginning to attempt to fulfill the requirements. The main purposes of institutional repositories are to bring together and preserve the intellectual output of a university. The number of significant developments, such as the launch of MIT's Dspace, University of California's e-Scholarship and the growth of repositories based on the University of Southampton's EPrint software have brought the issue of institutional repositories increasingly to the fore. Further the open access and open archives movement and the changes in scholarly communication to remove barriers to access have begun driving the establishment of institutional repositories. In India we

2. INSTITUTIONAL DIGITAL REPOSITORY

Institutional repositories are an emerging trend among institutions of higher education. In recent months, a flurry of excitement and activity has surrounded the stated desire by scholars, academic libraries, and universities to reclaim the scholarly communication process from the sole control of the predominantly privately held commercial publishing industry. The paper, "The Case for Institutional Repositories: A SPARC Position Paper," defined and introduced the concept of "institutional repositories" to a wide audience as digital collections that capture and preserve the intellectual output of a single or multi university community,

providing a compelling response to two strategic issues facing academic institutions. Such repositories:

(i) Provide a critical component in reforming the system of scholarly communication-a component that expands access to research, reasserts control over scholarship by the academy, increases competition and reduces the monopoly power of journals, and brings economic relief and heightened relevance to the institutions and libraries that support them; and

(ii) Have the potential to serve as tangible indicators of a university's quality and to demonstrate the scientific, societal, and economic relevance of its research activities, thus increasing the institution's visibility, status, and public value.

An Institutional Repository (IR) is a digital collection of a university's scholarly/creative output. Institutional repositories collect, preserve, and make accessible the knowledge generated by academic institutions. IRs also form part of a larger global system of repositories, which are indexed in a standardized way, and searchable using one interface, providing the foundation for a new model of scholarly publishing. An institutional repository (IR) is defined to be a web-based database (repository) of scholarly material, which is institutionally defined as opposed to a subject-based repository; cumulative and perpetual (a collection of record); open and interoperable (e.g. using OAI-compliant software); and thus collects, stores and disseminates. In addition, most would include long-term preservation of digital materials as a key function of IRs.

2.1 Definition of Institutional Repository

Despite of the amount of press that the topic of institutional repositories has received in the past few years, providing a concrete, precise definition of an institutional repository (IR) is difficult to do. According to Clifford Lynch, executive director of the Coalition for Networked Information describes an IR as "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."

To be successful an IR must provide the set of services needed by its unique community of users, and these services will and should differ from institution to institution.

The SPARC position paper on IRs has been influential in setting the agenda for the IR debate. Crow argues that there are two key rationales for IRs:

• Reform of scholarly communication, and in particular scholarly publishing;

• To enable the institution to enhance its prestige by making visible the fruits of its faculty's academic and research labours.

Stated broadly and in the context of SPARC's focus, a digital institutional repository can be any collection of digital material hosted, owned or controlled, or disseminated by a college or university, irrespective of purpose or provenance. The content of an Institutional repository are:

(i) Institutionally defined;
(ii) Scholarly;
(iii) Cumulative and perpetual; and
(iv) Open and interoperable.

3. DEVELOPMENT OF SCHOLARLY INFORMATION REPOSITORIES

In the 1990's, a broad movement to enhance public access to scholarly journal articles through the use of "pre-print" servers, based on the Open Archives Initiative (OAI) protocol, began to grow. OAI-compliant database software generated standardized metadata, which could be harvested and read by any OAI-compliant search engine. Essentially, the idea of these servers was that authors would deposit their pre-prints (not yet published work) into such servers, providing readers worldwide with a quick way of obtaining access to research results, without needing paid subscriptions to the source journals. These types of servers also referred to as "repositories" or "archives", began as informal vehicles for the disseminating of preliminary research results and non-peer reviewed literature.

In the last decade, we have seen the rapid evolution of these servers into increasingly important mediums for the dissemination of research results in certain fields. This model of disseminating

scholarly work is broadly used in the physical sciences arXiv, but is also becoming more widely known in many other fields, such as health sciences BioOne, and the humanities and social sciences Cogprints. Institutional repositories adopt the same open-access and interoperable framework as pre-print archives, but rather than being discipline-based, represent the wide-range of research output produced by one institution.

Major motivating factor for the development of institution Repository are the high cost of scholarly journals, preservation and the need to facilitate open access to scholarly communication. Another is the preservation of the materials scholars are producing in digital format. Open Access began as an academic discussion and has now become a movement to turn the world's research literature into a global resource accessible to everyone over the Internet. Leading research organizations, publishers, and library associations (including IFLA and CILIP) have issued position statements. Last year's World Summit on the Information Society endorsed Open Access as a means of encouraging development around the world. The Open Access agenda has even attracted the interest of politicians, spawning legislation in the U.S. Congress and hearings in the U.K. House of Commons. These major development lead to establishment of Institutional Repositories. Since then institutional repositories of scholarly content have been receiving increasing attention recently

4. INDIAN SCENARIO

The cause and effect of rapidly changing technologies and the impact of the internet have deep implications for issues such as journal crises, open access, copyright to Indian higher education system too. This has lead to the formation of more than ten consortium in India in last 3-4 years with the facility to access more than 4000 e- journals under two major consortium viz, UGC-Infonet- E-journals consortium (for university under UGC). and INDEST, (the consortium of IITs, IISc, IIMs and the Engineering Colleges funded by MHRD and AICTE). Scientists, research scholars, and faculty members of the member institutions can access these journals without any fee. Keeping the pace with the open access moment, MSSRF, Chennai organized two workshops on open access. NCSI has organized a workshop on Institution Repository for INDEST members. The Indian Institute of Science has initiated Eprints Archive, which contains 1009 documents produced by researchers at the Indian Institute of Science (IIS). The archive runs on e-prints, open archive software. INFLBNET

has explored Dspace open source software and configured DAchieve http://dspace.inflibnet.ac.in which contains the full text of CALIBER and PLANNER proceedings. At the time of writing, we have noticed few more Indian institutes using Eprint and Dspace software, notable among them are 164 records of DRTC, https://drtc.isibang.ac.in/ The site contains Librarians' Digital Library (LDL), implemented using DSPACE. Indian Institute of Information Technology (http://eprints.iiita.ac.in) and Rajiv Gandhi Center for Biotechnology (http://www.rgcb.res.in) also configured open source software and working on submission of content. This is just a beginning and we have to go long way from present state. All the scientifiv, research and academic institutes in India should follow the example of IISc. Country like UK and USA, Australia, Canada have already framed a policy for self achieving using open source software. As we have seen the whole process of scholarly communication is currently undergoing a revolutionary change. We too have to think seriously and embark upon open access establish repositories. The funding agencies in India (ICMR, DAE, CSIR, UGC, ICAR) should encourage establishment of such repositories and put a condition on research grants to submit the finding of research in to institutional repository. When a grant recipient publishes the results of funded research in a journal, pre-print of the article should be submitted to central repository.

5. OPEN ARCHIVES PROTOCOL FOR METADATA HARVESTING (OAI-PMH)

The Open Archives Protocol for Metadata Harvesting (OAI-PMH) is an increasingly popular protocol for sharing metadata about digital objects. The OAI-PMH is essentially a set of request/response messages, which may be sent over HTTP to retrieve metadata that is encoded in XML. This Protocol originally developed as a means for metadata dissemination of preprint and e-print servers, OAI-PMH has become a widely known solution to connecting distributed electronic repositories of many kinds, and owes much of its acceptance to its simplicity and the comparatively very low costs of its implementation. The protocol enables effective, broadcast searching of e-print archives. A service provider, such as an institutional e-print repository, describes its resources using metadata. This provider abides by protocol standards that enable harvester applications to gather these metadata. The system uses simple Dublin Core as expressed in XML as its common denominator, thus ensuring proper identification of data elements. Standard client/ server

architecture facilitates the metadata exchange between the harvester and the repository. Without this relatively simple, though ingenious tool, the contents of repository would only be accessible to a user aware of that specific repository. Detailed information on the Protocol for Metadata Harvesting is available at <www.openarchives.org/OAI/openarchivesprotocol.html>. The Open Archives Initiative Protocol for Metadata Harvesting provides an application-independent interoperability framework based on metadata harvesting. There are two classes of participants in the OAI-PMH framework:

(i) Data Providers administer systems that support the OAI-PMH as a means of exposing metadata; and
(ii) Service Providers use metadata harvested via the OAI-PMH as a basis for building value-added services

The potential of simplicity associated with the harvesting model is fully realised in the OAI-PMH protocol. OAI-PMH leverages the interoperability already guaranteed by familiar Web-based standards to simplify and thus accelerate the deployment and adoption of the model. In particular, OAI-PMH follows modern and well-tested design practices in being a lightweight HTTP-based client-server protocol of XML-encoded requests and responses between, respectively, a service provider and a data provider. Requests may take one of only six forms, and be about the metadata of one resource, or about the metadata of many resources, or about the capabilities and protocol compliance of the data provider itself. For flexibility and efficiency, requests may also be: incremental. The underlying resource model is also rather simple, for it assumes that resources are associated with one or more descriptions and that each description is encoded in one or more formats, the availability of at least one XML-encoded unqualified Dublin Core description being the only mandatory requirement.

6. SOFTWARE

There appears to be general agreement that there is now adequate, easily available software to create and maintain an IR. As a result, the challenges in setting up an IR are now seen as being less to do with technology (although the problems of long-term preservation are very far from solved) and more to do with managerial, organizational and cultural issues.

The two leading software packages, Dspace (MIT) and Eprints (Southampton) are both available free under open source licences, and there are at least half a dozen other possible packages. In theory, commercial document management or knowledge management software packages might also be suitable but are unlikely to be adopted given their costs.

6.1 DSpace

The DSpace software has been purpose built in collaboration between Hewlett Packard and MIT to offer IR services. It is specifically designed to manage diverse heterogeneous types of digital content. It offers interoperability via OAI-MHP (Open Archive Initiative – Metadata Harvesting Protocol – a software standard that allows specialized search engines to gather article metadata from compliant websites) and built-in support for Dublin Core metadata (Dublin Core is an agreed metadata standard used in library cataloguing and elsewhere, though other metadata schemes are possible). It uses persistent identifiers (which are like URLs but have the benefit that unlike ordinary URLs they do not change when the linked document's physical location is changed) via the CNRI Handle system.

6.2 EPrints

The EPrints package is more oriented towards e-print archives, as the name suggests. It is also OAI-MHP compliant. It does not directly support persistent identifiers (though presumably it does not rule them out).

6.3 Other packages

Other software packages being used, or planned to be used, for IRs include

6.3.1 CDSware

Developed by CERN and used to run its very substantial CERN Document Server (over 630,000 bibliographic records, including 250,000 full text documents).

6.3.2 Bepress

Created by The Berkeley Electronic Press for the University of California's e-Scholarship Repository.

6.3.3 Kepler

The purpose of Kepler is to give any user the ability to easily self-archive publications by means of an "archivelet": a self-contained, self-installing software system that functions as an Open Archives Initiative data provider.

6.3.4 Fedora

An ambitious project developed jointly by Virginia and Cornell with funding from Mellon. Fedora is a general-purpose digital object repository system that can be used in whole or part to support a variety of use cases including: institutional repositories, digital libraries, content management, digital asset management, scholarly publishing, and digital preservation.

6.3.4 i-Tor

Tools and technologies for Open Repositories was developed by the Innovative Technology-Applied (IT-A) section of Netherlands Institute for Scientific Information Services. i-Tor acts as both an OAI service provider, able to harvest OAI compatible repositories and other databases, and an OAI data provider.

6.3.5 MPG eDoc

Developed by the Max Planck Gesellschaft in cooperation with the Fritz-Haber Institute. Currently used by many Max Planck institutes to "capture, document, share, archive, publish, disseminate and manage their scientific documents and the results of their research";

6.3.6 MyCoRe

MyCoRe grew out of the MILESS Project of the University of Essen and is now being developed by a consortium of universities to provide a core bundle of software tools to support digital libraries and archiving solutions (or Content Repositories, thus "CoRe").

6.3.7 OPUS

Online Publications University of Stuttgart. Also used by University of Konstanz.

6.3.8 Ebrary

The aggregator / database company is offering a "new product that enables libraries to cost-effectively create online institutional repositories of documents such as theses and dissertations, technical reports, e-prints, articles, curricula guidelines and special collections. In preparation, we're extending a free pilot program to

our existing customers and libraries that subscribe to our databases";

6.3.9 Ingenta

Have already announced collaboration with Southampton University to develop a commercial version of EPrints. Ingenta say that they have undertaken considerable research into author/university requirements.

7. REPOSITORY POLICY

The faculty members generate lots of scholarly publication in diverse platform and in many formats. These resources need to be preserved for future use, which requires clear policy and guidelines. An institutional repository can fail over time for lack of proper policy, management failure, incompetence, or technical problems. Any of these failures can result in the disruption of access, or worse, total and permanent loss of material stored in the institutional repository.

Policies provide guidance when unexpected situations—positive or negative—arise. The policy framework is the greatest challenge here. Systems need to design to accommodate the policies we need to put in place. Policy needs to reflect the culture of each institution. IRs are entirely new line of business for libraries. A fundamental principle for successful implementation of IR is that libraries should have very special trust-based relationship with faculty. Policies should encourage faculty and there participation as simple and easy as possible. Metadata needs and forms will vary.

Successful development of a repository requires that users clearly understand what services they can expect from the repository, what responsibilities they have as contributors to the repository, how content will be managed, and how decision-making will be distributed. Moreover, the resource requirements for the repository program cannot be reliably estimated without prior decisions on some of these policy issues. They are:

(i) What Services are core to the repository Program?
(ii) Who may contribute to the Repository?
(iii) What content is appropriate?
(iv) Preservation and migration
(v) Rights management
(vi) Cataloging (Metadata Creation)
(vii) Central versus distributed repositories

7.1 Core to the Repository Program

(i) **Deposit and Withdrawal Services:** processes that support contribution (ingest) and deletion of digital objects.

(ii) **Access Control and Rights Management:** to restrict access to the information when open access is premature or otherwise not desirable.

(iii) **Administrative Services:** The Repository program should support administrative functions such as workflow design, review of submitted papers prior to dissemination, review of metadata.

(iv) **Metadata Services:** support for the creation of metadata at the point of contribution, and assurance that the metadata will be available to search engines (within the repository and externally) and / or harvesters.

(v) **User Support**

(vi) **Storage Space** in specified amounts for each participating center/department, and assurances of **Secure Data Management** to protect the integrity of contributed data through services such as back-up and recovery, error-checking, data-refreshing, and security against unauthorized modification.

(vii) **File Naming (Name Resolution) Service** to assure the permanence of object names in the repository.

(viii) A **Search Engine** to support searching both within the local repository and across the repositories of multiple institutions.

(ix) **Preservation and Migration** of files and metadata in approved formats to new platforms

7.2 Contribution to the Repository

Are all members of the university community eligible to contribute content? If so, how will the institution's reputation for quality be assured?

7.3 Content Appropriateness

What kinds of content are appropriate for the repository? Faculty research? Teaching materials? Undergraduate projects?

7.4 Preservation and Migration

What commitments can the repository make to provide long-term access to files in various formats? Define those commitments in terms of preservation of the functions and/or original appearance of those files.

7.5 Rights Management

What are the legal requirements for contribution to the repository? Once posted, who owns the content? What kinds of restrictions (if any) may be set on the audience authorized to view the material? May material be withdrawn after posting, and how will decisions to withdraw material be made?

7.6 Cataloging (Metadata Creation)

Who will create the metadata that will make the material findable? What kinds of metadata and which standards will be used?

7.7 Central versus distributed repositories

Though implementation of standard like OAI- PMH does not make much difference whether the repository is central or distributed. Maybe both can coexist and maintained because OAI-interoperability has made them completely equivalent. But policy will help to maintain repositories.

All these issues need to be addressed by involving faculty, administration and librarian. Faculty members feel that they are being helped and advanced through IR services. Successful implementation of IR needs faculty participation. Librarians can mediate between the central administration and the faculty.

8. CONCLUSION

Keeping in view the recent changes in scholarly communication, emergence and various standards and protocols, and trend towards open access, INFLIBNET like JISC in UK is exploring the possibility of institutional repository and archiving faculty publication of universities in India. There are tremendous resources, which is untapped and not available for access for the users. These content needs to be managed, preserved, and maintained for larger access to the users. Faculty members want additional visibility for their resources. INFLIBNET in future aims to

provide a comprehensive system for managing these resources and play a pivotal role of repositories of these valuable resources. In this direction, Centre has opted Dspace open source software for achieving institutional publications including CALIBER and PLANNER proceeding. Institutional repositories offer a strategic response both to the opportunities of the digital networked environment and the systemic problems in the today's scholarly journal system. This response can be applied immediately, reaping both short-term and on-going benefits for universities and their faculty and advancing the transformation of scholarly communication over the long term.

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BAR CODE AND ITS APPLICATION TO LIBRARIES IN DIGITAL ENVIRONMENT

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ABSTRACT

Defines the barcode technology, clear the objective, and trace the historical development of barcode technology. States hardware, software requirement. Explain the application of barcode technology in making the library systems and services automated. Reveals the merits and limitations barcode technology.

1. INTRODUCTION

Now a days, libraries and information centers are being compelled for automating their services and functions in order to provided better, faster and pin-pointed services to clientele by adopting new technologies. In this way barcode is proving a better technology in order to fill the objectives of libraries and demand of users.

2. BAR CODE

A bar code consists of a series of bars and spaces arranged to a set of rules, which determines how data is to be represented. Different symbologies use different bars and space patterns. They are readable only by a scanner. Barcode by itself is not a system but an identification tool that provides an accurate and timely support of the data requirement for sophisticated management systems.

3. OBJECTIVES

The main objectives of bar coding documents in a library are the following:

(i) to improve operational efficiency

(ii) to save the time of users

(iii) to achieve accuracy

(iv) to reduce operational cost;

(v) to make stock verification an easy process, and

(vi) to make effective and fast services of transactions.

4. HISTORY OF BAR CODE

The history of bar code be traced to the supermarkets, which gained popularity in the US supermarkets were required to stock thousands of products of different brands. For avoiding these problems, the efforts of many persons were involved. In 1977, the first high density symbology was invented which was developed to pack all the required data into a small label. In 1987, MSI introduced the first pocketable bar code reader called the Data wand. That time, symbol technology introduced its LS 7000 first hand-held moving beam laser scanner.

5. TECHNICAL IMPLICATIONS

The fundamental requirement for implementing bar code technology in the libraries can be divided into hardware and software requirements are as follows:

5.1 Hardware requirement

a) Scanner

That is required for reading and scanning the data. The different types of scanners are available for different purposes. That can be divided into two parts.

- **Common Hand Held scanner:** Those are Wand scanner, Laser scanner.

- **Non Contact Scanners:** In which CCD scanners, long range hand held laser scanners, omni directional scanners, Excepts these various types of scanners can also fulfill the various requirements.

b) Printers

Most bar code printers fall into three categories which are as :

- Laser printers
- Thermal printers
- Impact printers

Each technology is best suited for certain kinds of applications, and no one technology is best for all.

c) Decoder

A black box referred to as a wedge, handles the job of translating the data. This box is simply small specialized computer that is programmed to translate incoming data into standard format.

d) Data entry terminal

For inputting the data, a microcomputer is a basic requirement.

5.2 Software requirement

a) Application Software

Software can include any library software, which are compatible with the barcode technology and carry collection and membership database such type of library software are ALICE for windows, Smart Card and SIM etc.

b) System Software

Operating System. MS-DOS, PC-OS2 & PC-UNIX.

5.3 Other basic requirements

The bar code labels which are printed in house or off site by commercial houses.

6. APPLICATION TO LIBRARIES

Barcode facility can be adopted by the libraries due to its uncountable benefits and eliminating the human error in library functions.

6.1 Membership identification

The bar code can be useful for checking the authorized user of the library. A bar code reader/scanner can be installed at the gate of the library and every person entering the library has to place his/her identity card on the reader/scanners. If the person is

not member not member of the library, the computer will give the alarm and thus restrict the entry.

6.2 Circulation

In barcode environment, the tedious process of issue and return can be avoided. The user can produce his/her identify cards and the staff can scan identity card and activate the borrowing status. If the computer permits the borrowing facility, the document is scanned for accession number and is issued to the user.

6.3 User Statistics

The bar code facilitates in preparing the list of users using the library and their arrival time and can avoid doing entries in the register manually. The report, about the accession number, title author and no of books issued to the user, can also be acquired with the help of the barcode identity cards if the library management software is so efficient to give the required information.

6.4 Checking at the Gate

When user leaves the library with the documents, the accession no. of the document can be scanned by the scanner inform whether it is issued to the user or not.

6.5 Issue of No dues Certificate

When a member leaves the organization/institution, his/her membership is cancelled and the library issues no dues certificate. This process is time consuming and error prone in a manual system. In an automated system using barcode technology, the member surrenders his/her identity card and the counter staff scans it. The automation package will search the database for any document issued in his/her name. If nothing is due, no dues certificate will be printed.

6.6 Stock Verification

The tedious and cumbersome process of stock verification can be avoided by using the hand held scanner of barcode. The accession numbers in the form of the barcode can be scanned and matched with the document database. This information about

the missing document can be accessed. Weeding out of the documents and updating of records also become simpler through this process. Thus, this technology helps to verify the stock of the library systematically, quickly and accurately.

7. MERITS

The use of barcode system increases efficiency and avoids human errors due to fatigue and psychological reasons as in case of manual data entry. There are several multiple and multiplicative improvements possible as follows:

(i) improves efficiency of the staff and quality of services

(ii) increases the speed of operation

(iii) enhances accuracy

(iv) increases user satisfaction and hence improves the image of the library

(v) the space, of keeping, together the borrower's tickets and book card can be saved

(vi) saves the time of users

(vii) data integrity

(viii) positive users attitude towards the library

8. LIMITATIONS

In spite of so many advantages and usefulness of barcode technology, some drawbacks can also be observed at the time of application of this technology. These shortcomings can be seen more in developing countries or under-developed countries.

(i) The user may not place the barcode identity card on the scanner kept at the main entry gate. So one person has to be deputed at the gate for checking whether users are placing their identity card on the scanner or not.

(ii) If barcode is used on chip which gives the signals about unauthentic users, one person has to be there for immediate checking.

(iii) At the circulation counter, the network systems and electricity problems should not come in this process other

wise these weaknesses decrease the efficiency of the system.

(iv) To paste the barcode labels and to scan the barcodes from the documents is also time consuming and one or two person have to depute if the library is big, if they are preparing barcode labels by itself for their library.

(v) The library automation software should be so efficient in order to work with barcode technology.

(vi) This technology is costly affair.

9. CONCLUSION

The barcode technology proves to be a mile stone in the automation of library management system. This technology is best for making a library as a digital library. It helps in the management of resources of library and their services. The limitation of the barcode system can be eliminated by adopting the error free network system and power failure. The proper funds are also needed for making the digitized library. Thus we can say that limitations of this technology are few and can not decrease the benefits of this technology.

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CONTENT MANAGEMENT IN DIGITAL LIBRARY: SOME ISSUES

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ABSTRACT

Content management is an essential unit of digital library that is used to popularise any website. It can be text, image, graphics, video, sound etc or in other word any thing that is likely to be published across internet and intranet. Content management is effectively the management of the content, by combination rules, processes and workflows in such a way that centralized webmaster and decentralized web authors /editor can create edit, manage and published all content of the web page in accordance with a given framework or requirements. The paper tries to focus on the concept of content management and its component, component of content management and also describe some design issues related to the content management process in the context of digital library.

1. INTRODUCTION

One of the most dramatic changes in the ongoing information revolution is the rapid convergence of computing, communications and content industries. Digital content, especially in the form of large, distributed, heterogeneous collections of electronic objects - text, voice, images, graphics, video, and others - is fueling the growth of the computing and communications in each other

The importance of content management has grown with the development of digital libraries. The digital libraries are involved in creation, collection, organization, and dissemination of digital content. The existence of digital libraries depends largely on the effective management of content. Several personal characteristics and the new skills and competencies are essential for the librarians to create and manage digital contents and services

2. DIGITAL LIBRARY

A digital library is a collection of information that is stored and accessed electronically. The information stored in the library should have a topic common to all the data. For example, a digital library can be designed for computer graphics, operating systems, or networks. These separate libraries can be combined under one common interface that deals with computers, but it is essential that the information contained within each library remain separate. The purpose of a digital library is to provide a central location for accessing information on a particular topic. The last thing a user wants to happen when he searches for information about computer graphics is to get information on operating systems. A digital library must keep topics separate; otherwise it would be totally useless. A digital library should also have a user interface that is easy to use.

3. WEB CONTENT

Web content can be articles, pictures, products, e-mail archives, Flash presentations, and streaming audio etc, This content need a systems for creating the content (authoring), describing it (metadata tagging), changing and updating it (editing), stopping the wrong people from manipulating it (security), keeping track of how it has changed (versioning), deciding when to display it (scheduling), displaying it in the right standard format (templating), allowing it to be displayed by others (syndication), allowing it be displayed differently to different visitors (personalization) and more.

4. CONTENT MANAGEMENT

Content management allows content to be stored, retrieved, edited, updated, controlled, and then output in a variety of ways that the incremental cost of each update cycle and output production shrinks dramatically over time. In the context of internet, CM address the process of creating, editing, reviewing,

re-using, publishing and managing elements of content in an efficient manner so that the website operations can achieved at production quality. Sometimes called 'knowledge management'. Content management is often used to refer to the process of handling information presented in either a buy- or sell-side catalogs, including part numbers, descriptions and unit size. It also refers to the process of capturing, storing, sorting, codifying, integrating, updating and protecting any and all information.

5. OBJECTIVES OF CM

(i) To introduce new strategy to be developed for both conversions from print source and also creation of electronic form.

(ii) To make it available the content information/data through network effectively to end-users.

(iii) To represent the standard structure of data one has to use the existing guidelines available at national and international level.

(iv) To act as a retrospective tool for entertainment and education and also culturally important resources.

(v) To promote computer literacy, software development, networking, etc.

(vi) To keep a watch on the nation and international trends in the information industry.

(vii) To provide a forum for the exchange of experience among the information providers, suppliers and the users.

6. COMPONENTS OF CM

6.1 Data Repository

The data repository is the organization of the content to facilitate access, updating, and re-distribution. The specific organization of the information will depend on how it is to be accessed. The data repository might be one of the commercial relational-database products of varying size and power, or a custom database. It can be accessed from a local network, intranet or the Internet. The security to control authorized access must be included.

6.2 User interface

The set of screens used to interact with the data make up the user interface. Since a CMS is typically an integration of several

products, it will utilize several different-but-familiar interfaces, specifically those of Internet browsers and word processors. Frequently those are used in combination with custom interfaces designed to fit the specific process needs of an organization or publication.

6.3 Editorial tools

Word processors and SGML editors are key components of most CMS solutions. They provide tools that allow content creation and editing, thus facilitates the ongoing processing of the content. The ideal set of editorial tools allow authors to work in a software environment that they are comfortable with, such as a word processor or text editor, following a few basic rules.

6.4 Workflow Scheme

The workflow scheme keeps track of each data element, its check-in and check-out history, as well as its version history. That allows those checking on the status of an article to know whether it has been accessed, is being edited, has been submitted for copy editing, has been returned to the author for re-work, or has been accepted in its final form. The workflow scheme can also generate custom reports to provide status information in a variety of formats. It allows the publisher to control the content and process.

6.5 Out put Utility

The output utilities are filters that take information in the data repository and format it for various publishing media.

7. CM PROCESS IN DIGITAL LIBRARY

Effective content management requires clearly defined roles and documented workflow for all forms of content in digital library. This includes review and approval processes and clear interdepartmental hand-offs. The common functions in CM process in digital library are:

7.1 Browser Compatibility

The most important issue during the design and testing of the web site of digital library is the wide range of browser types and versions of browsers. In most of the cases, the choice of browser

is restricted to that prescribed by the institution, which ensure that users of this browser version could view the web site correctly.

7.2 Design issue

Designing issue is one of the most important tasks for the development of digital library. Design is the origination phase of the CM process. In this phase, we define the content that will be published or installed on the website.

7.3 Authoring

Technical writers, advertising writers, application developers, webpage developers, lawyers, human resource personnel, and marketers all are involved in the authoring of content. Authored content is often put under version control through the use of document management system or source code management systems.

7.4 Text Review

A review process is required for all website's contents. Reviewer responsibilities need to be well established and integrated into the flow of the content creation and deployment cycle. This facility has proved highly popular among users. They prefer to use this text-only version for its simplicity and speed of use.

7.5 Approval

The normally multi-departmental nature of web content management requires well-defined approval processes. Formal approvals are required from the early stages of content creation through final deployment.

7.6 Conversion of File/Page Size

Conversion includes transforming word processor documents to formatted HTML text, modifying bitmapped images to load faster on the web, changing image formats, and modifying database elements. The Web Edit Pro tool can handle web pages of a certain size (in terms of HTML). Very long pages slow down the speed of the tool. However, this was considered to be an implicit advantage, as it would discourage CMS users from creating single web pages of abnormal length.

7.7 Storage

Content is usually stored directly in file systems or versions control systems. Web content is the file system that replicates hierarchical structure of the website.

7.8 Testing

It includes identifying broken of missing links; identifying slow loading pages; load testing; component testing; database access; script testing, etc.

7.9 Maintenance and Updates

The CM process does not end when content completes its journey to the website. The task of monitoring the content and updating it when necessary will keep the site fresh and working properly.

7.10 Retirement and Archival

Having old and out-of-date content on a website does not project a positive image. Further, misleading information on public website could lead to legal trouble.

7.11 Reporting and Analysis

Web site and user/customer analysis needs to be an ongoing process for a successful web content management in digital library.

8. CONCLUSION

With the advancement of Internet technology, content management which was quite impossible few years ago has become lingua franca or out rightly cosmopolitan in today world, rather in twenty-first century Internet technology means that any medium-sized organization with web ambitions can now spend million dollars almost instantly. Web sites are an integral part of an organization's operations. Web sites are used to actively promote companies and products, deliver services, information, management transactions and facilitate communications. The need for rapid change and the sheer size of today's dynamic digital library to makes it impossible for all revisions to flow through one or two people. Complexity and speed have created the demand for automated ways to effectively manage web

content. Content management is a new name for electronic publishing. The core objective of publishing is to get the right content to the right person at the right time at the right cost. Publishers manage publications. The key staff includes authors and editors. Almost immediately many of us were being thrust into a new delivery medium, the Internet, with its own data-format needs. After getting through all that, when the time for a new print edition rolled around we had cost increases, not reductions, because the electronic data files were not left in a form useful or print. So the content management is very important to the design and development of digital library.

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FUTURE OF THE LIBRARIES: CHANGING ROLE OF ACADEMIC LIBRARIES IN INDIA

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ABSTRACT

The future of the library is a topic of great importance for the higher-education sector as well as for the library sector. This paper discusses the challenges before academic libraries in India, new contexts, responding to the new context, renewing the service orientation, knowledge organization, harmony with other units on the campus, advances to outsourcing, academic library networking in higher education and the influence of these developments on university libraries, and academic librarian and his roles for 21st century. It is assumed that university libraries will acclimatize to change in education and research institutions as they are transformed through the digital revolution. Many libraries, whether in higher education or not, are strengthening their education missions in their own right. However the focus today is on universities, on the need for change in their information services, and on the broader range of services which university libraries might provide in meeting that need.

1. INTRODUCTION

In the past few decades, advances in Information Technology (IT) have driven revolutionary changes in the ways we work, learn,

and communicate. Progress in the development of microprocessors, networking, massive data storage, imaging, and software has created new infrastructures for business, academic research, health care, and social interaction and new opportunities for economic development. Internet technologies are helping us build global networks that provide wide access to distributed information. As these advances eliminate barriers of space and time, we gain increasingly more direct and immediate access to scholarly materials, to the world's rare historical artifacts, to visual art, to recorded music, and to broadcast archives. Such monumental change demands that we re-conceive our models of the contemporary research library and the partnerships necessary to help it flourish. It also requires that we rethink the roles librarians play in this changing landscape.

The change facing our libraries is analogous to the evolution of computing. In the early days, computing occurred on mainframes tended by technological priests who served as mediators between the user and the hallowed computational space. But when distributed computing emerged in the 1970s and 1980s, the need for mediation between the user and the computers was eliminated. As the desktop PC provided immediate access to computational capability, the staff of the university-computing center no longer focused on tending the sacred flame of the mainframe. They facilitated distributed computing. By parity of reasoning, the role of the library as a physical repository of knowledge will also be utterly transformed when virtually all knowledge can readily be accessed electronically by anyone. The role of librarians will then be to facilitate distributed access to what an individual or organisation really needs to find and know in this ocean of distributed information.

The twenty-first century university library can and should be a creator of new knowledge; an innovator in developing collaboratively built and collectively held digitized collections. University librarians can and must take a leadership role in today's distributed information environment, becoming increasingly more engaged in the creation, organisation, dissemination, and preservation of knowledge and building affiliations with other stakeholders also involved in these activities, both within and without their institutions. The key point is this: If we are to fully exploit the promise of technology, the university itself must break down the barriers that divide its traditional decentralized units and commit to a new way of doing business. Strong partnerships

between IT and the library are essential aspects of our ability to create the most productive balance between the old and the new. Digital technology can be our greatest tool in this effort. But realizing the promise digital libraries hold for our universities, and for our culture as a whole, requires us to radically rethink our model of the research library and to live and work in a new landscape of highly integrated technology and human capital.

2. CHALLENGES BEFORE ACADEMIC LIBRARIES IN INDIA

Many academic libraries have, over the years, consistently added new services as the opportunities and needs arose, to the point of adding a whole electronic services dimension, while discontinuing only the least significant services, if any. In view of the decline in general funding and the steady erosion of purchasing power caused by inflation, libraries have often accomplished these changes by reallocating internal resources, constantly defending existing human and financial resources, and successively adding to the workload of everyone. How can we better respond to these challenges? What is the appropriate role for academic librarians to play in this new context?

2.1 Diminishing fiscal bases

Academic libraries all over the world are facing new challenges. Economic downturns in many regions have seriously diminished the fiscal bases of many colleges and universities and, consequently, the financial resources of academic libraries. The economic crisis has directly and indirectly affected academic libraries in India. At the same time, as a result of rapid technological advances, all academic libraries experience escalating expectations and demands from library users. Like executives and managers in the business world, academic librarians are expected to achieve greater results with fewer resources.

2.2 Least priority for Libraries

Libraries are always spending institutions. Though in recent times resource mobilization is in the major agenda of modern libraries, they cannot be at any cost the profit making organizations. Hence they need to be nursed by its parent organisation. But unfortunately the educational institutions in recent decades are caring very little for their libraries. The reasons are many,

diminishing reading habit among the students, diminishing financial resources of the academic institutions and their self-financing approaches are some of them. In such cases the organizations will always look for cutting their budgets and the libraries are the first hits among the other units of the academic institutions. In the academic environment the chief executive should be library oriented. Otherwise it will be difficult to justify the expenditures of the academic libraries.

2.3 Declining reading habit among Students

Although the modern technological developments are boon for the growth of our society, they are to some extent disadvantageous for libraries. Use of Xeroxing is a best example of this problem. Student whenever they see an article or a chapter in a book or some times a whole book, they get it Photostat. How for they read that Xeroxed material is still in question. Use of Internet is another example. Many a times not only students even teachers say that we get every thing on Internet specially Google. It goes very difficult for librarians to convince such arguers that the information contained on Internet is unauthenticated and not peer reviewed where as the information contained in the electronic journals is peer reviewed and exhaustive.

Hence it becomes a basic responsibility of the librarian to spare the part of his routine time to be spent in different classrooms to remove this misnomer from the minds of students and teachers and make them to use the reading material from the library.

2.4 Lack of Awareness among Librarians

Librarians in this decade are of two type one the traditional man on the verge of his retirement and has very little flair for the technological adaptation and the other who is an young man who has been trained with the modern technologies and has got urge to do some thing. This partnership of professionals works very well in very few cases when the Librarian has an open mind to accept the new technologies and encourage his subordinates to implement the same. Whereas it is the other way round in many cases. Many Librarians do not like his subordinate to excel him and show more intelligence and hence curtails him from implementing his ideas. In some of the worst cases the Librarians hate the technology and technological applications in Libraries. They desire to get retired before this new boom comes true. That will be too late for that library.

2.5 Raising expectations of the Academicians

Gone are the days of the academic researchers spending six months of their time in searching the literature and traveling from one place to other for their literature search work. Some of the funding agencies still pay the assistance for visiting libraries. Now the researchers are able to collect the maximum amount of literature before they decide for their topic and set the problem. Hence there will be a strong pressure on the part of the libraries to cope up to the expectations of the researchers. Similarly the teachers and students from the classrooms.

Hence the librarians must be well prepared with the location of reading materials other than his won library. He must possess the list of journals procured by different libraries in the country and create a database of the same. He should also respond to such calls from different libraries so that he can establish a friendly environment among his professionals. He must always be YES LIBRARIAN for any queries than telling NO to any requests.

3. NEW CONTEXTS

Along with the new challenges that the academic libraries in the 21st century are facing there are new contexts, which are taking place and are making the Librarians job still more complex.

3.1 Interdisciplinary growth of subjects

The universe of knowledge is ever growing and research work in different subject is taking place in collaboration with other subject thus giving raise for the new interdisciplinary subjects. Hence the subjects' growth is found vertically than the horizontally. This throws the challenges before the Librarians who classify the books according to subjects and make compartmentalization of subjects. Whereas the users expect their all books to be placed in one place like Marine Biotechnology, Microbiology, Econometrics, Medical Jurispidence etc. This necessitates the Librarian to change his mindset from Melvil Dewey or Dr. S.R. Ranganathan the creators of classification schemes and find a solution to facilitate the uses. Any deviation from the theory of Librarianship to facilitate the user approach is the best practice of Librarianship.

3.2 Diversified user needs

The user needs are always diversified. Earlier days the reference Librarian and the periodicals section staff were regarded as walking encyclopedias. As there were less subjects, no technological developments, just browsing all the new journals contents page will enable the periodical section staff to speak to the users and inform them about the publication of their interested articles. Similarly the reference Librarian with a couple of hundreds of reference books could prove successful.

Where as in the modern days of knowledge and technological growth, the Librarian's role has become more complex. He cannot prove himself successful until and unless he expertise himself with the new technologies and spend lot of his time on Internet and match the relevant information to the interest areas of his users.

3.3 Lack of Intensified Information

Librarian cannot be a master of all subjects. Many a times it goes difficult for the teachers of the particular subject to keep themselves updated with the new developments their areas it. Hence Librarians when a user searches with a narrow key word may not be able to retrieve any results and will have to turn his face blank.

But a Librarian with knowledge of thesaurus approach and skills of Boolean logic may be able to retrieve many results, which will satisfy the user requirements.

3.4 Lack of professional supports

This is another lacuna for the profession. Unlike many other professional associations, which support for the growth of their profession, Library Associations are still in their own internal quarrels and doing very little to the development of the profession. This is the period our profession needs lot of nursing and shaping. Now IT professionals are entering the profession of Librarianship. Many of the top positions are being filled up with such manpower without any background of library science. Some of those who have been recruited to such higher positions in Indian libraries claim that Dr. S. R. Ranganathan who is called as Father of Library Science in India was also appointed to the higher post without any Library science background.

Yes, this argument hold good. But Dr. S.R. Ranganathan dedicated himself to the profession and studied Library science as a student in a formal education in UK and prepared himself as inevitable tool for the profession.

3.5 Lack of Manpower Training

Library and Information Science education has crossed one hundred years in India but unfortunately it has not grown when compared to any other professional education. Even the LIS schools in western countries have geared up to the requirements of the profession. Today we find the LIS schools in western countries par with that of any Information Technology schools. The products of these schools will be independent and need not look for the assistance from computer centers or departments.

Now in Indian environment we find the professionals more handicapped due to want of technological knowledge updating.

Hence, it is essential that the LIS schools must change their pedagogy along with the changing technological developments.

3.6 Lack of Motivation to the Professionals

The LIS professionals especially juniors need to be motivated. The professional Association and the senior professionals must give proper directions to the young Librarians. Five laws of Library science of Dr. S.R. Ranganathan is Vedas for our professionals, which the schools of Library science these days are removing from their syllabus in order to accommodate more IT components.

4. RESPONDING TO THE NEW CONTEXT

Looking at the challenges, technological trends and the new context the profession has to take a swift from its traditional approach and change its attitude with the changing technological developments and user needs. Among the things we urgently need to do are reshaping the vision of academic librarianship and adopting new concepts and principles to guide library management, especially in the light of what is going on in higher education. Of course, no librarian agrees that academic librarians operate in a state of conceptual isolation from rest of the higher education. But certain lines of thinking about strategies of

developing a viable academic library for the 21st century seem still to be bound by or limited to the strategies of decades ago.

4.1 Librarianship to Cyberarianship

Along with the traditional responsibility of custodianship of books and other reading materials today Librarians have to change their attitude and convert themselves into cyberarians. In this cyber age most of the information can be retrieved from Internet. The intelligence of Librarians is traced in their efficient retrieval of knowledge from the sources. The reference librarian has to be more efficient in these skills.

4.2 Teaching Library

The Library should also play the role of teaching. There are several things that the users of the library have to be informed. In absence of the same they will be restricted to a limited search results or some times nil.

Hence, the library should conduct continuous training programs to its users about the use of library, its OPAC and other databases. The Library can also conduct classes for literature search from full text databases and even n'efficient searching of search engines like Google etc.

4.3 Marketing of Library Services

The academic libraries in order to promote their library use should implement the marketing strategy and attract the users towards their resources. Crores of rupees worth collection must be put to use at any cost. Otherwise it will be a national waste. Hence Librarians bear this in their mind and act like a chief of a business, which never allows his products and services under utilized.

4.4 Reaching the Unreached

The outreach activities of the Library should be extensively implemented and must try to reach the users who are unable to use the library in one or the other reasons. The Library should try to go to such classrooms and make them informed about the resources of their interest available in the library. Some of the reading materials, which are very little used and have not attracted any users, must be brought to the notice of their potential users.

Librarian must also take the concerned teachers in to his confidence and request them to recommend to their students.

4.5 Resource generation

The library from generations together is known to be a spending institution. It is only a service unit of its parent body. However, with such a huge collection worth of crores of rupees, it is advisable to put the resources to use and generate some minimum revenue for the parent body, though not in a commercial scale. This earning should at least support the extended services to our academic community.

There are several research and development (R&D) units of Industries who are spending huge price for their information requirement. Academic Libraries that are capable of meeting the requirements of these groups must work dynamically and create an opportunity of revenue mobilization. However, it is essential for the libraries to give prompt service to the institutional members when we charge them for supply of information.

4.6 Training the Decision Makers

Though this caption is not tastier for the decision makers, but it is however, necessary to keep them informed about the library's requirements and its targets. Many a times this task is not done by Librarians and hence they will fail to get appropriate approvals and implement their desired activities. This is just because of poor information supply to the Decision Makers. Organizing regular visits of higher authorities to the library itself will take care of majority of this task.

4.7 Training the Professionals with changing technologies

Training and re-training the trained professionals should be a continuous activity of any library. Knowledge is ever growing and the techniques of information access and retrieval are ever changing. Hence it is quite essential to update us every now and then. Librarians cannot afford to end their learning process at any time. They must get trained themselves and train others to equip their library with updated staff.

4.8 Manpower Motivation

Conventional organisation development wisdom says, "everything is connected to everything else". This sweeping statement informs us that when one part of an organisation is manipulated, all other parts will feel the impact. A holistic, system approach has enormous strategic importance when attempting to exert the influence and lead organizations through a chaotic change process. The leader should involve others, take a system approach, build relationships, welcome problems and influence his colleagues with his examples.

The professionals who have been trained sufficiently and start functioning skillfully in one library will start looking for changing of their jobs for better prospects. This is the common practice in IT industries. Similarly, in libraries the junior staffs with IT expertise are more in demand. Hence it is necessary to retain such staff by giving them the regular incentives what they deserve from time to time.

Modern libraries unlike the traditional approach of hire and fire, should give better opportunities for their staff to grow and encourage them to contribute with their full mind. So that, professionals will feel secured and stay longer in that organisation.

5. RENEWING THE SERVICE ORIENTATION

The Library should keep on renewing its services from time to time than restricting ourselves to the "Short range and Long range Reference Services" of Dr. Ranganathan's time. We should change our services depending on the changing technology and changing expectations of the user community.

The Librarian must give a creative leadership to his subordinates and enable them to work in a team. Every wing of the library should be encouraged to work in competition with the other. So that they will be able to create new services from every sections.

The access to e-resources under UGC-Infonet program is a big boon for the academic libraries in India. We should try to understand the cost of these resources if subscribed independently. Many of the Librarians are giving very little

attention to this and are neglecting the huge knowledge store given to them.

We should try our best to expose the knowledge contained in these e-resources to the academic community. The Librarian should keep in touch with e-publishers and try to make best use of the trial versions of their databases.

6. KNOWLEDGE ORGANISATION

Learning never stops even for a single moment in life. Library is a lifelong learning center and a laboratory for its users. Librarians must try to take teachers to their confidence and request them to recommend the resources in the classrooms. So that the students will know about the availability of different sources in the library and they can reach for the sources of their interest in the library.

The Libraries if functioned in this fashion can convert the whole education system in to a 'Library centered Learning'. Peer learning and teaching assistance the libraries can undertake programs. The libraries can assist the teacher to equip him or herself more effectively and go to the classrooms confidently. Technologically we can prepare their presentations and abreast them with new knowledge in their area of topics.

The orientation and reorientation should be a routine activity of the academic libraries. Many libraries confine this activity to the beginning of the academic year. But this should be a yearlong activity. The Library should have a well-equipped 'Media Resource Center' with higher bandwidth of Internet connectivity. This will enable the library to popularise its e-resources retrieval activities along with the orientation programs.

7. HARMONY WITH OTHER UNITS ON THE CAMPUS

The modern days librarianship cannot be complete only with the mere efforts of the librarians. For successful practice of librarianship we need to have support of many other service units of the academic organisation. Some of the following units will be of most essential for successful functioning of the libraries:

(i) Campus Telecommunication Center
(ii) Campus Computer Center
(iii) Publication & Extension Units

(iv) University Science Instrumentation Center
(v) School of Management
(vi) School of Mass Communication

8. ADVANCES TO OUTSOURCING

Outsourcing is the slogan of the current decade. In order to concentrate on our targeted achievements, some of the routine activities can be outsourced. So that, the library staff can concentrate on the technical services where their involvement is essential. Following are some of the activities that can be outsourced:

(i) Data Entry
(ii) Bar-coding
(iii) System Maintenance
(iv) Database Management
(v) Website Design and Maintenance
(vi) Reprography & Micrographic Services
(vii) Digitization, OCR and Text Editing of rare collection

9. ACADEMIC LIBRARY NETWORKING

Networking is one of the most essential aspects for academic libraries of this decade. The future of the academic libraries is more dependent on Networking and Consortium arrangements for their resource sharing. This reduces the duplication and enables the resource building among networked libraries.

Best example in this regard is Goa Library Network (GOALNET), Goa University Library has already initiated for networking of academic libraries in Goa State. All the bibliographical databases of these member libraries are put on the Goa University Library server and enable each of the libraries to access the union catalogue through the Internet. Now efforts are on to subscribe the electronic full text resources on consortia arrangements. The Goa University Academic Library network can be accessed under the following URLs:

<http://goalnet.unigoa.ac.in>
<http://goalnet.unigoa.ac.in:8080/newgenlibctxt/index.jsp>

10. 21st CENTURY ACADEMIC LIBRARIAN

The metamorphosis of the profession of librarianship has been phenomenal over the years with the advent and exploration of the Internet and the World Wide Web by the libraries. Technology evolves rapidly, and competitively, leading to a diversity of tools, hardware, software, formats, platforms, applications, standards and protocols. The academic librarian is required to sustain continuously expansive competencies, and to remain steadily aware of how to evaluate new technologies as they are invented.

The Academic Librarian of this Century must be more dynamic and scholarly. Their environment has shifted from one that relied heavily on print sources to electronic formats. Because of these changes in the academic environment, the librarian must also change his or her focus, become current, and remain current with the information field. Rapple (1997: 114) says the idea that "computerization will take over and sound the library's death knell" is not true. There will remain a need for people to disseminate and report on quality resources for students and professors in the academic field. Rapple (1997: 114) states "the librarian's traditional function as mediator between information and patron will expand and become more diffuse and challenging." Academic Librarians have taken on new facets of their job such as webmaster and information architect. Creth (1996) 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)".

The job of 21st century academic librarian is emerging from his or her own corner of the university to the entire campus. They visit classrooms for library instruction, they are Webmasters, and they help their fellow faculty find the information that they need in this digital age. So, he should be a teacher of teachers and student of students. He should keep his eye and ears open for new developments and transfer the same instantaneously to his user community. He should be a top Public Relations man and practice all Public Relation (PR) skills in his day-to-day routines. He should love his users and get loved by them. He should be open-minded and keep himself away from egos, which separate him from his user community. He should also be courteous and humane. He must be a good communicator and highly interactive. He should always keep his eyes on e-mails and keep his users informed sooner a query is received. His instantaneous responses should

make the users to feel like visiting the library and use its resources. Few new roles and openings that are available for academic librarian in the digital age are presented in the following section.

10.1 New roles of academic Librarians

(i) "Guardian of Information superhighway
(ii) Guardian of the global digital library/the universal digital library
(iii) Digital librarian acts as symbiotic human-machine guru
(iv) Navigation, browsing and filtering
(v) Multimedia search and indexing
(vi) Knowledge and data mining
(vii) Search and retrieval co-ordination
(viii) Interface functions and roles in the management of digital information service
(ix) Accessing and retrieval of digital information through digital library access tools
(x) Mobile information access: a vision of tomorrow" (Sreenivasulu, 2000).

Like it or not, new technologies are changing the academic librarian's role and the opportunities to enhance one's role have become boundless. "To take the advantage of the opportunities, information professionals must keep up with the emerging technologies, recognize the opportunities to utilize their skill sets, and work effectively for implement change" (Akkamahadevi, 2001).

11. CONCLUSION

Academic libraries need to enhance and upgrade current technical architecture to accommodate digital material. The architecture includes: 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, variety of servers, such as Web servers and FTP servers and electronic document management functions that will aid in the overall management of digital resources.

The challenge of challenges has added new dimension to the roles and responsibilities of the academic librarians. There are many challenges for Librarians and Information Professionals in

the process of engineering the digital information in academic libraries. These challenges and collaborations include creating Interface infrastructure, application of Artificial Intelligence, Experts Systems, Knowledge-Based Systems and the Development of Info ATMs Technologies, Tools and Though there are many challenges, especially regarding global collections and academic user communities, there are also exciting opportunities. Hence the information professionals have to keep constant watch for newer developments and noticeable changes in the future of academic libraries and its changing role. To cope up with the information needs with speed and relative accuracy and reliability, the academic library is the most important and reliable resort, and so knowledge discovery predominant factor.

It is desired that this paper need not have any conclusion, as there should not be an end to the creativity of a Librarian and all of these challenges must be at the forefront of our minds as we work to create library services and programmes for the future.

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GAIN-PROJECT: A STRIDE TO DIGITAL PUBLIC LIBRARY SYSTEM IN MADHYA PRADESH

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ABSTRACT

Public libraries disseminating Information, Literacy, Education and Culture and all kind of knowledge readily available to the society. These libraries are believing in democratic values and disseminating the information on the basis of equality of access for all, regardless of age, race, sex, religion, nationality, language or social status. Unfortunately, Government (centre, state) and society are careless on this important public issue, due to this carelessness of the society public libraries of Madhya Pradesh facing sever problems to their existence. Initiative of Rajiv Gandhi Siksha Mission for upgrading the Public Library System and Network of Madhya Pradesh, Project called GAIN (General Access information Network) popularly known as "*Gyan* (knowledge /wisdom)" providing state-of-Art equipments to facilitate the State and District libraries of the state, which creates a possibilities to fabricate a network amongst these libraries. This article is an effort to present an outlines of this project, and possibilities of networking in upcoming scenario. With help of technologies public libraries will be converted into a panacea of all social diseases (illiteracy, unemployment, unawareness etc.) prevailing at present.

1. INTRODUCTION

Libraries stimulate the imagination of a society and make it grow. 14 November 2002 Inauguration of GIAN in all districts of Madhya Pradesh. This is a project for upgrading State library and District Libraries by incorporating electronic content through GIAN (General Information Access Network). Technical support to implement GIAN will be organized through Rajiv Gandhi Shiksha Mission (RGSM) which in turn will nodalise such support through MAPIT. it will be certainly a panacea for the destroyed and grim condition of Public Library System in Madhya Pradesh.

2. OBJECTIVES OF GIAN

(i) Upgrading the existing facilities in the district and state libraries of the state of Madhya Pradesh to become effective knowledge dissemination centers and hubs of intellectual activity.

(ii) Reposition these existing libraries as knowledge centers of the twenty-first century by modernizing them with new media of knowledge storage and dissemination like electronic media and thereby goes beyond print that is the only form of knowledge stores in these libraries.

(iii) Create ownership for the libraries through transferring their management to local communities of interested people. This could include donors and private sector support for selected services.

(iv) Create a "revenue model" for the unit so that an income stream is generated to keep the GIAN in an effective condition and not to be dependent on grants / doles.

(v) Utilize the grant provided by the Eleventh Finance Commission to enable the improvement of the Public Library System through incorporation of GIAN.

3. NEW OPPORTUNITIES: GRANTS FROM THE ELEVENTH FINANCE COMMISSION

In this context the decision of the 11th Finance Commission to provide a corpus to upgrade the State libraries and the District Libraries could not have been timelier. A budget provision of 50 lakh is available for upgrading the state library and 20 Lakhs for

the district level libraries. The government of Madhya Pradesh proposed to create a new stream of GAIN (Knowledge) or general Information Access Network, which would consist of a refurbishing public library with state -of -the art information technology support including a unit of 10 computers with internet Connectivity.

4. GIAN: IMPLEMENTATION

A core group for management would be set up at the state -level to manage the programme. This core group will in turn create District level Management Teams. This state level team will be advised by a Technical Advisory Group. The task of the District Management Team will be three fold ;

(i) Create public ownership for the library through a plan implemented by this forum.

(ii) Ensure timely completion of refurbishing work and incorporation of GAIN package of electronic content.

(iii) Create a Revenue stream to make GAIN self-financing.

5. ACTIVITIES TO IMPLEMENT GIAN AND INCREASE PUBLIC OWNERSHIP OF PUBLIC LIBRARIES AT DISTRICT-LEVEL

(i) Each library must have a Mission statement on its modernization plan and resources must be located from grants and local efforts to implement the plan.

(ii) Each library must have a collection statement on its stock and plans to augment.

(iii) Each library must create a local Development Fund through contributions.

(iv) Each library must fix a charge for use of GIAN unit for internet use at reasonable rates and the fund should flow into the local fund.

(v) Members of District Management Committee must catalyze a "Friends of the Library" movement.

(vi) Library should set apart a place as a children's corner; People should be encouraged to volunteer time to read to children.

(vii) Libraries must organize discussions in literature, theater, cinema etc.

(viii) Technical personnel must be requested to volunteer services as friends of the library

(ix) There has to be 100% training of staff on handling electronic content. This training will be organized through vendors who supply hardware as part of the tender condition.

For implementation of the plan the state library would be treated on par with the District library and will be different only in terms of resources availability.

6. SUPPORT TO DISTRICT TO IMPLEMENT GIAN

(i) In the state government, the implementation unit of GIAN will be the Department of School Education, which today manages the library system. Through GIAN the effort is to reposition the libraries as District entities owned and supported by Districts. Establishment costs like salaries and other expenses incurred presently will continue to be provided by the School Education Department.

(ii) Technical support to implement GIAN will be organized through Rajiv Gandhi Shiksha Mission which in turn will nodalise such support through MAPIT.

(iii) Funds would be placed with Districts for implementing the modernization plan.

(iv) Each district will draw up its plan for a self-financing model for GIAN and inform the state government.

7. MANAGEMENT OF THE GIAN PROJECT

There are three task groups will be coordinate the whole system of the project, these groups are well construct and protected from state government, are followings :

7.1 Core Management Group at State - Level

Chairperson	:	**Chief Minister**
Members	:	Minister School Education
		Chief Secretary
		PS, School Education
		PS, Sports and Youth Welfare
		PS, Urban Development

Secretary, Elementary Education
and Mission Director, RGSM.
CEO, MAP IT
Economic Advisor (Finance)
CPI
Secretary to Chief Minister and
Mission Coordinator (Convener)
Experts (co-opted)

7.2 Technical Advisory Group

The task of this Group is to provide content support for the modernization plan in terms of suggesting core component and strategies. The following could be the composition:

Chairperson	:	**PS, School Education**
Members	:	Head University Library, SNDT University Mumbai Head, Information Division, South Asia, American Centre Vice Chancellor, IGNOU CEO, MAP-IT Secretary of Chief Minister and mission Coordinator Chief, American library Mumbai Head, British Library, Bhopal Head, Library Science, Jiwaji University, Gwalior Secretary, Elementary Education and Mission Director, RGSM Commissioner, Public Instruction

8. DISTRICT- LEVEL MANAGEMENT TEAM

Chairperson	:	**Collector**
Members	:	Mayor / Head of local Body CEO Municipal Commissioner Principal, DIET DEO DPC, RGSM Experts Donors from the community

9. FUTURE SCENARIO

GAIN project will be a very optimistic approach to strengthen the public libraries system with new generation technologies, otherwise libraries will assumed as only a store house for the books.

Computerizations of system and services of libraries will help to provide global information opportunities to the users.

Modern public library system can make a lot of difference in every walks of human life and uplift the living conditions. There is the right time for the public libraries should be convert into a multiple information hubs of the society, essentially we will have to kick out the old conceptions about the public libraries, where libraries works like a warehouses of useless print materials.

There is certain need to set a new target and role for the public libraries in the modern society, where libraries are able to effect all walks of the human life, some as follows ;

(i) To revive local crafts and trades at the national and international level. Provides information feedback to the craftsman's, which is a major source for rural livelihood and our heritage.

(ii) To spread out awareness about technological changes in agriculture (which is too conventional) sector with help of all available information channels to the farmers.

(iii) To work as a principal awareness center for the government policies for the people.

(iv) Create as major activity center on current issues and events (election, census, political changes, policy matters, national and international sensitive issues, awareness about basic issues).

(v) To create as a popular channel for awareness and help to indigenous and alien tourists at local level.

(vi) Create as an open democratic institution for common people, where all the intellectual activities and counseling services may be possible for social cause.

(vii) To provide a powerful channel of communication and information to the persons especially at root level and not be able to get such awareness and help from other channels.

Initiative taken by GIAN project is only a stride to modernize the public library system, the system needs to immense support and positive approach of government, non-government organizations, society and international forums of the world. My sincere believe that, public libraries are the remedy for all social diseases and able to change whole compiexion of the present scenario, especially on revival of traditional arts, crafts, treads and create immense job opportunities of world wide to the creators.

10. CONCLUSION

Today the world is driven by intellectual capital. The key resource for development and economic growth has become knowledge. These libraries are potential power houses for providing public access to knowledge. New Technologies have now enabled wide spread sharing of knowledge especially through the Internet. The role of Public libraries therefore becomes very important because the best of world's knowledge can be accessed by the ordinary citizen only through a public access point like the library. Therefore there is an urgent need to upgrade and reorient these libraries using the revolutionary potential of information technologies to transform the world of knowledge storage and knowledge sharing. In changing scenario, this initiative has been taken by the RGSM for upgrading the infrastructure of Public library system of Madhya Pradesh state, where libraries were struggling for their survival due to Government policy towards public libraries, working in poor and grim conditions, certainly it will be prove a panacea for the Public Library System of Madhya Pradesh.

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HYBRID LIBRARY: A WAY TO DIGITAL LIBRARY

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ABSTRACT

The rapid advancement of information and communication technologies (ICTs), have changed the traditional methods of information dissemination and attitudes of information seeking behavior of the users. As a result, the information professionals are struggling to render quality library services to prospective users in the real world, due to the complexity and diversity in almost all aspects of the information access chain. Diversity is really a problem not only for information providers but expected users also to access relevant sources of information. The paper deals with hybrid library - its initiative, step-by-step planning and designing, technologies and nature of development. It also discusses various issues and concerns, opportunities and problems not only during the developmental phase of the library but also during operational phase of the library.

1. INTRODUCTION

The term 'hybrid library' is unlikely starts in UK during 1990s. The impact of sophisticated technology on library and its application in one hand and the huge growth of literature on the other forced the library professionals to ponder over the matter on how to satisfy the users' requirements. This led to the growth of Hybrid library is a 'one-point-shop' where users can get both digital electronic as well as print materials.

The hybrid library is on the continuum between the conventional and digital library, where electronic and paper-based information are available. The challenge of managing hybrid library is to encourage end-users resource discovery and information use in a variety of formats, in a number of ways, in a seamlessly integrated

way. It is more of a traditional phase between the conventional library and digital library. The convention of 'gateway library' is for instance, one which doesn't replace books. It is true that the existence of hybrid library will be retained for long time at least in India due to the advantages of books use and long habits of the users. Many developed countries have begun the initiatives of building hybrid library, digital library and virtual library.

While digital libraries are by definition focused on delivery of access to collection of digital works, there is a body of informed opinion that "Really the objectives is to develop information systems providing access to coherent collection of materials more and more of which will be in a digital format as time goes on, and to fully exploits the opportunities that are offered by the materials that are in digital formats. There is a reality, a very strong continuity between traditional library roles and missions and objectives of Digital Library systems. This thinking is based on the belief that the need of serious information seekers can only be meet by providing the user with access to both electronic and traditional information resources. In recent works, the MODELS (Moving to Distributed Environment for Library Services) Project, a UKOLN initiatives funded by the e-Lib program, has extended the hybrid library concept beyond the library domain, coining the phrase "Hybrid Information Environment". A Hybrid information environment can be described as one where an appropriate range of heterogeneous information services is presented to the user in a consistent and integrated way via a single interface. It may include printed or distributed services both print and electronic.

2. PLANNING AND DEVELOPMENT

(i) Planning is an important instrument for any organizations for development. Many countries have taken initiatives for developments of hybrid library. A hybrid information environment can be one where an appropriate range of heterogeneous information services is present to the users in a consistent and integrated way via a single user interface. It may include local or remote distributed databases to access both print and electronic resources. Therefore, during planning, the issue has to address that Hybrid Library is more than a interface offering integrated discovery of resources where they are in analog or digital format, where they are local or national or international.

(ii) The objective of planning should take care of the development of information system providing access to a coherent collection of materials, more and more of which will be of digital format as time goes on.

(iii) Another aspect has to address is the manpower planning. It is an important issue in order to develop hybrid library because staff need to be familiar with many new technologies required to use for the development of digital library.

(iv) During the developmental phase of the hybrid library, 'the level of integration' at every stage has to be addressed. Integration of provider's information is another aspect to be taken into consideration. The libraries' catalogue which integrates access to libraries physical information is a good example. It required separate processes and systems have to be developed in order to access the digital resources and managing physical format.

(v) Another aspect that is not less important is budget. Appropriate amount has to be sanctioned to have the minimum requirement like a good scanner, scanning software, and appropriate relational databases like oracle, SQL Server, Internet connection and trained library professionals with sufficient knowledge of handling digital library.

3. HYBRID LIBRARY: ISSUES AND CHALLENGES

3.1 User Issue

Although library and Information services are based on user-centered approach, the issue has now become more acute due to the heterogeneous type of users group in university or research centers. It is recognized that the information need, IT skills and information seeking behavior of undergraduate students are different from research students or teachers. Following observations are made

(i) Users wanted more copies of a particular document;
(ii) Users were frustrated when resources are shown in the OPAC but could not find in the library
(iii) Users often had difficult to searching OPAC

(iv) Guidance from library staff is required in need of them
(v) Users of the concerned library are required to have more orientation of library resources at the beginning and basic training of how to exploit fully the required resources.

3.2 Library Services

Within the library services as a whole the online library services has become prominent. Like, library website, library online is seen as major development of library services, books loan facility etc is highly important. A big issue for many UK universities is convergence between computing and library services. In the context of digital library development, there is a lack of understanding of what each group is doing and lack of respect for each other's professional skills. Many writers pointed out that digital reference librarian should be active and should propagate a wide range of information available with them.

3.3 Problems of Integration

When building a digital library around a specific set of resources often selected with a useful degree of coherence, it is easy to create usable and useful system for users. Resources are like books, – some are loadable, some are reference, paper based journals, specific collections like, charts, maps, slides, video recordings. Maps need to have different interface than text because of its nature. The web is beginning to provide an interface which overcomes the problem of heterogeneity. Any resources available through web are likely to have more chances to overcome heterogeneity.

3.4 Problem of Authenticity

Another major issue against effective use of electronic and digital materials is the wide range of authentication procedures. But authentication in the digital world can be major problem, especially if every digital object has a separate authentication challenge. Many people raised the issue that print materials are more authenticate than digital materials.

3.5 Prices, Costs and Copyright

Increasingly, many digital resources come with a price tag, sometimes quite large. Many individuals are out of reach these materials. But library on behalf of institute negotiating with the

publisher can able to provide access to those digital materials. Copyright is a major issue in digital library environment. In digital rights environment, copyright means licenses. But there should be some kind of conformity on the format & conditions of licenses.

3.6 Archival of Digital Objects

Any hard disc or digital materials or digital materials container can be put into some usable convenient dust proof box; otherwise you can use mobile box also for the optimum utilization of space. It is suggested to keep all the materials in low temperature within the range of 20^0 to 25^0 C and less humid condition. In order to control humidity, it is suggested to use 'De-humidity Fire'. To protect from uncertain fire, automatic fire control system like 'FM 200' which is more powerful to control all types of fire which carbon dioxide cylinder gas can't. Another special feature of FM200 is that it does not affect the archival materials. It is also suggested that there should not be any window. Besides, archival door should be 'Fire-Fighting-Door', which is having the capacity of protecting fire at least 2 hours. Besides, regular pest control is suggested.

4. TECHNOLOGY FOR HYBRID LIBRARY

(i) A good number of existing technologies are to be used in providing the foundation layout of hybrid library. Among the most emerging technologies. Among the most emerging technologies, Internet and World Wide Web (WWW) will have to play a large part as they are the backbone of information delivery. The hypermedia nature of the web allow it to act as both the front end of the hybrid library search system and also the means of delivery of any electronic resources that the end users locate.

(ii) To provide the integrated searching over multiple databases, we are developing upon the Z39.50 which an American standard is made a huge impact on information retrieval on the Web. Now for the HL which is offering a single user interface all over the world. If the system blindly sends all queries to all databases, the network would quickly grind to halt.

(iii) To solve this problem, what is needed is 'forward knowledge' that allow the query to be routed forward to the relevant databases. A technology that is currently being

developed in this regard is called Common Indexing Protocol (CIP). It allows databases to provide the summaries of information that they hold.

(iv) Dublin Core it is a potential barrier to domain searching has been the divergence of metadata standards between the world of traditional publications and.the world of digital publications. Dublin Core metadata standards have been developed during last few years back. One has to support "simple resource discovery" for digital collection. Dublin core will be useful for searching across the various collection levels.

(v) Multiple Z39.50 targets, the library catalogue is not necessarily a single Z39.50 target. Most library systems support logical data model consisting of at least three separate targets: bibliographical databases, an authority databases and a holding databases. The validity of virtual union catalogue will depend upon the implementation of Z39.50 from logical holding databases.

(vi) Storage and delivery of digital objects. Many digital library use single system to manage both the resource discovery process and the storage and delivery of digital objects. This is an appropriate architecture where a single agency is responsible from both the digital objects and resource discovery services.

(vii) Metadata it is used to describe a whole variety of different types of materials from printed books to videos, websites and even museums feasible and desirable to be able to find multimedia resources side by side is one search.

5. REFERENCE LINKING IN HYBRID LIBRARY

(i) The creation of services linking related information entities is an area of attraction in the ongoing developments of the WWW in general. Currently, both practice and theory point at linking services as being a major domain for innovation enabled by digital communication. Linking services add value to the information dissemination.

(ii) Most writing in electronic scientific communication have traced out other benefits like increase in communication

speed, possibility to exchange multimedia documents, eradication of the limitations of length of research paper. These are the same areas where linking service plays a pivotal role. Publishers, subscription agents, researchers and librarians are all linking into the areas to add value to linking related information.

(iii) In the context of network library services, the necessity to integrate secondary data catalogues and primary data has left long back. Librarian realized to link the abstracting databases with full-text primary information. These specific links ideas have evolved towards a concept of connecting all the available information in order to develop a fully inter-linked information environment.

(iv) Linking mechanism that has been developed in the scholarly environment can be categorized into two (a) Static and (b) Dynamic depending on the architectural set-up of the information location.

(v) Static Linking : Most initiatives have taken in the field of static linking concept. Links between information entities are computed in advance and kept in the linking databases. Records in such a databases of static links describe relations between information entities in a controlled environment. Static links are foolproof in the sense that following a pre-computed link will lead to desired target.

(vi) Dynamic Linking : Some initiatives have emerged in decentralized environment where not all the data that is required to build an interlinked information environment can be under the control of authority. A 'priori' computation of the link is not possible and linking must be done in a dynamic way.

6. CONCLUSION

It is admitted that still lot of work has to be done to develop fully hybrid library. Web browsers really need to have Z39.50 functionality integrated into them so that end users have single front-end applications to cover all the aspects of information searching. Hybrid library is the transition phase between digital library and printed library but it's a feeling that such type of

transition phase will be dominated longer period in developing countries than developed countries. Among many challenges, 'integrated single resource discovery window' is really a challenge for information professionals. Besides, attitude and information seeking behavior of the users are important factor to be taken into consideration while planning into the digital library.

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MAJOR VIRTUAL LIBRARIES ON INTERNET: AN EVALUATIVE STUDY

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ABSTRACT

This article describes the concepts of electronic, digital and virtual libraries. The contents and structure of 8 major virtual libraries on Internet have been studied and evaluated by using the criteria like Authority, Authority Contact details, Currency, Navigational links, User Support links and Content Coverage. These virtual libraries are ranked using 100 point system.

1. INTRODUCTION

Driven by computers, satellites, laser beams and optic fibers, the information is triumphing towards the 21st century. The Industrial revolution took two centuries to run its course; the Information revolution has done the job in just two decades. This has given rise to a new mythology of the information society, where "Information Technology" is being presented as the new savior of mankind. Various phrases like Information age, Global information economy, and Electronic, Digital and Virtual library, Information Super Highway are appearing in library literature with considerable frequency.

2. ELECTRONIC, DIGITAL AND VIRTUAL LIBRARIES

An electronic library is a library consisting of electronic materials and services. Electronic materials can include all digital materials, as well as a variety of analog formats that require electricity to

use. For example, video tapes are an analog format that requires electronic equipment to view. Thus the term "electronic library" encompasses all the material that can be held by a "digital library", and is therefore more inclusive.

A digital library is a library consisting of digital materials and services. Digital materials are items that are stored, processed and transferred via digital (binary) devices and networks. Digital services are services that are delivered digitally over computer networks.

Virtual Library is a library in which the holdings are found in electronic stacks. It is a library that exists, without any regard to a physical space or location. It is a technological way to bring together the resources of various libraries and information services both internal and external, all in one place, so users can find what they need quickly and easily.

3. AIMS AND OBJECTIVES OF THE STUDY

The study was carried out with the following aims and objectives in view

(i) To navigate the Internet and find out major virtual libraries.
(ii) To analyse the contents and structure of these virtual libraries by using following criteria

- Authority Statement
- Authority Contact Details
- Currency
- Navigational Links
- User Support Links
- Content Coverage

(iii) To rank these virtual libraries

4. SCOPE AND LIMITATIONS

Scope of the study was restricted to surfing the Internet for tracing major virtual libraries. Total 8 Virtual Libraries were studied. These 8 libraries are:

1. WWW Virtual Library http://www.vlib.org/

2. Living web Virtual Library http://www.livingweb.com/
3. Internet Public Library (IPL) http://www.ipl.org
4. Librarians' Index to Internet (LII) http://lii.org/
5. INFOMINE http://infomine.ucr.edu/
6. LIBRARYSPOT.com http://libraryspot.com/
7. BUBL LINK http://bubl.ac.uk/link/
8. Virtual Library of Useful URLs
   http://www.aresearchguide.com/virtual.html

5. AUTHORITY STATEMENT

It has been observed that 7 virtual libraries provide statement of authority on their home pages. Only one library i.e. living web virtual library does not provide information about the authority. Credentials of the authority are provided by LibrarySpot.com only. Statement about authority for maintenance has been provided by 25% virtual libraries. It has been observed that all the 8 virtual libraries are copyrighted. Table - 1 presents the Authority details included in home pages of Virtual Libraries and Table - 2 presents the Analysis of authority details.

Table - 1 Authority details included in home pages of Virtual Libraries

Sr No	Name of the Virtual Library	Statement of Authority	Credentials	Maintenance Authority	Copyright Statement
1	WWW Virtual Library	Yes	No	Yes	Yes
2	Livingweb Virtual Library	No	No	Yes	Yes
3	Internet Public Library (IPL)	Yes	No	No	Yes
4	Librarians' Index to Internet (LII)	Yes	No	No	Yes

5	INFOMINE	Yes	No	No	Yes
6	LIBRARYSPOT.com	Yes	Yes	No	Yes
7	BUBL LINK	Yes	No	No	Yes
8	Virtual Library of Useful URLs	Yes	No	No	Yes

Table - 2 Analysis of authority details

Sr. No.	Criteria	No. of Virtual libraries having the facility	Percentage
1.	Statement of Authority	7	87.5
2.	Credentials	1	12.5
3.	Maintenance details	2	25
4.	Copyright Statement	8	100

5.1 Authority Contact Details

It has been observed that the contact details of the authority are provided on the home page of the virtual library in the form of a separate link or directly all the details are displayed on the home page in the footer region. Out of 8 virtual libraries, 3 (37.5%) provide separate link describing authority contact details and in other 5 virtual libraries these details are provided in footer region. The observations are reported in Table - 3 and 4.

Table - 3 Authority contact details

Sr No	Name of the Virtual Library	Contact link	Address	E-mail	Phone	Fax
1	WWW Virtual Library	No	No	Yes	No	No
2	Livingweb Virtual Library	No	No	Yes	No	No
3	Internet Public Library (IPL)	Yes	Yes	Yes	Yes	No
4	Librarians' Index to Internet (LII)	No	Yes	Yes	No	No
5	INFOMINE	No	Yes	No	No	No
6	LIBRARYSPOT.com	Yes	Yes	Yes	No	No
7	BUBL LINK	Yes	Yes	Yes	Yes	Yes
8	Virtual Library of Useful URLs	No	No	Yes	No	No

Table - 4 Analysis of authority contact details

Sr. No.	Criteria	No. of Virtual Libraries having the facility	Percentage
1	Contact link	3	37.5
2	Postal Address	5	62.5
3	E-mail	7	87.5
4	Phone Number	2	25
5	Fax Number	1	12.5

6. CURRENCY STATEMENT

It has been served that only 4 virtual libraries (50%) provide the information about last update date on their home pages. The frequency of updating the information is provided by only one virtual library i.e. living web. The observations are reported in Table - 5

Table - 5 Currency details

Sr. No.	Name of the Virtual Library	Last Access date	Last update date?	Update frequency?
1	WWW Virtual Library	14.06.2004	07-june-2004	No
2	Living web Virtual Library	12.06.2004	23-Feb-2004	Yes
3	Internet Public Library (IPL)	13.06.2004	No	No
4	Librarians' Index to Internet (LII)	10.06.2004	No	No
5	INFOMINE	14.06.2004	No	No
6	LIBRARYSPOT.com	09.06.2004	14-June-2004	No
7	BUBL LINK	13.06.2004	No	No
8	Virtual Library of Useful URLs	13.062004	10-June-04	No

7. NAVIGATIONAL LINKS

Navigational links are the links which help the user to browse the web document. Such links provided by virtual libraries under study were observed and reported in Table - 6 and 8. Analysis is shown in Table - 7 and 9. It has been observed that the virtual libraries under study do not show any such page where there is no single link and the user has to use the 'Back' button of the explorer to get out of that page. In all the virtual libraries the links

are clearly labeled. Pages or portions can be printed in all the cases. Images are used in all the 8 virtual libraries. But it has been found that the images slow down the downloading in 50% cases.

Table - 6 Statement of links supporting navigation (Part I)

Sr. No	Name of the University	Best Viewed	No link, Use of Back button	Use of Images	Images support navigation (Yes/ Slows down)	Links clearly Labeled	Pages/ portions be printed s Separately?
1	WWW Virtual Library	No	No	Yes	Support	Yes	Yes
2	Livingweb Virtual Library	No	No	Yes	Slowdown	Yes	Yes
3	Internet Public Library (IPL)	Yes	No	Yes	Slowdown	Yes	Yes
4	Librarians' Index to Internet (LII)	Yes	No	Yes	Support	Yes	Yes
5	INFOMINE	Yes	No	Yes	Slowdown	Yes	Yes
6	LIBRARYSPOT.com	Yes	No	Yes	Support	Yes	Yes
7	BUBL LINK	Yes	No	Yes	Support	Yes	Yes
8	Virtual Library of Useful URLs	No	No	Yes	Slowdown	Yes	Yes

Table - 7 Analysis of links supporting navigation (Part I)

Sr. No.	Criteria	No. of Virtual Libraries having the links	Percentage
1	Best Viewed	5	62.5
2	No link, use of Back button	0	0
3	Use of Images	8	100
4	Do images support navigation?		
	Yes	4	50
	Slows downloading	4	50
5	Links clearly labeled	8	100
6	Pages/ portions are printed separately	8	100

Table - 8 Statement of links supporting navigation (Part II)

Sr. No	Name of the University	Home link on each Page	page be located from any other page?	Back & Forward links between pages	Concise (C) / Scrolling pages (S)	Effective Search Facility	Key word searching	Index/ Site Map
1	WWW Virtual Library	Yes	Yes	No	S	Yes	Yes	Yes
2	Livingweb Virtual Library	Yes	Yes	No	S	Yes	Yes	No
3	Internet Public Library (IPL)	Yes	Yes	No	S	Yes	Yes	No
4	Librarians' Index to Internet (LII)	Yes	Yes	No	S	Yes	Yes	No
5	INFOMINE	Yes	Yes	No	S	Yes	Yes	Yes
6	LIBRARYSPOT.com	Yes	Yes	No	S	Yes	Yes	No
7	BUBL LINK	Yes	Yes	No	C	Yes	Yes	Yes
8	Virtual Library of Useful URLs	Yes	Yes	Yes	S	Yes	Yes	No

Table - 9 Analysis of links supporting navigation (Part II)

Sr. No.	Criteria	No. of Virtual Libraries having the facility	Percentage
1	Home Link on each page	8	100
2	A particular page can be located from any other page	8	100
3	Back, Forward &/or Top links between pages	1	12.5
4	Concise Page	1	12.5
5	Scrolling Page	7	87.5
6	Effective Search facility	8	100
7	Keyword searching	8	100
8	Index / Site Map	3	37.5

8. USER SUPPORT LINKS

Links like E-mail help desk, Telephone help line support the user while browsing. The virtual library web sites were analyzed to study these criteria. It has been observed that in all the 8 virtual library sites, the links are not ambiguous. The links are self explanatory. E-mail help desk is provided by all while Telephone

help line is provided by none of them. In all cases links are provided to other related web sites and virtual libraries and the do work efficiently. Table - 10 and 11 presents the statement of provision of user support links.

Table - 10 Statement of provision of user support links

Sr. No	Name of the University	Self explanatory links	E-mail Help desk	Telephone Helpline	Links to other web sites	Do they work Efficiently?
1	WWW Virtual Library	Yes	Yes	No	Yes	Yes
2	Livingweb Virtual Library	Yes	Yes	No	Yes	Yes
3	Internet Public Library (IPL)	Yes	Yes	No	Yes	Yes
4	Librarians' Index to Internet	Yes	Yes	No	Yes	Yes
5	INFOMINE	Yes	Yes	No	Yes	Yes
6	LIBRARYSPOT.com	Yes	Yes	No	Yes	Yes
7	BUBL LINK	Yes	Yes	No	Yes	Yes
8	Virtual Library of Useful URLs	Yes	Yes	No	Yes	Yes

Table - 11 Statement of analysis of user support links

Sr. No.	Criteria	No. of virtual libraries having the links	Percentage
1	Self explanatory links	8	100
2	E-mail help desk	8	100
3	Telephone help line	0	0
4	Links to other web sites	8	100
5	Other web site links work efficiently	8	100

9. CONTENT COVERAGE LINKS

The virtual libraries selected for the study are rich in their content. When its motto is to serve the users, it should cover the information about all the major subjects. The content coverage links of these virtual libraries were analyzed during the study. Table - 12 presents the analysis of content coverage links.

Table - 12 Analysis of Content Coverage Links

Sr. No.	Criteria	No. of Virtual Libraries having the links	Percentage
1	General Reference	8	100
2	Creative Arts	7	87.5
3	Humanities	7	87.5
4	Language, Literature, Culture	5	62.5
5	Social Sciences	7	87.5
6	Life Sciences	7	87.5
7	Mathematics	6	75
8	Computer Science	6	75
9	Physical Science	5	62.5
10	Alphabetical listing	5	62.5
11	Countrywise classification	2	25
12	DDC wise arrangement	3	37.5
13	Business Economics	7	87.5
14	Government Information	4	50
15	Maps and GIS	4	50
16	Links to other virtual libraries	4	50
17	Links to Search Engines	5	62.5
18	Databases	8	100
19	Links to E-journals	4	50
20	Directories	4	50
21	Magazines	5	62.5
22	News Papers	4	50
23	Education and Libraries	7	87.5
24	"About"	7	87.5
25	Visitor Number (Hit Count)	3	37.5

10. RANKING OF VIRTUAL LIBRARIES

Ranking of these 8 virtual libraries was done as per the ranking system suggested. Table - 13 and 14 presents the Scores assigned for ranking the virtual libraries.

Table - 13 Scores assigned for Ranking the Virtual Libraries

Sr. No.	Criteria	Maximum Points	WWW VL	Livingweb	IPL	INFOMINE	LII	Library Spot.com	BUBL LINK	VL of useful URLs
1.	Authority									
	• Statement of Authority	2	2	2	2	2	2	2	2	2
	• Credentials	2	0	0	0	0	0	2	0	0
	• Maintenance Authority	2	2	2	0	0	0	0	0	0
	• Copyright	2	2	2	2	2	2	2	2	2
2.	Authority Contact details									
	• Postal address	2	0	0	2	2	2	2	2	0
	• E-Mail	2	2	2	2	2	0	2	2	2
	• Telephone Number	2	0	0	2	0	0	0	2	0
	• Fax Number	2	0	0	0	0	0	0	2	0
3.	Currency									
	• Last Update date	3	3	3	0	0	0	3	0	3
	• Frequency of Updating	3	0	3	0	0	0	0	0	0
4.	Navigational links									
	• Best Viewed	2	0	0	2	2	2	2	2	0
	• All the pages hyperlinked	2	2	2	2	2	2	2	2	2
	• Images supporting navigation	2	2	0	0	2	0	2	2	0
	• Clearly labeled links	2	2	2	2	2	2	2	2	2
	• Portions can be printed	2	2	2	2	2	2	2	2	2
	• Home link on each page	2	2	2	2	2	2	2	2	2
	• Location of pages is easy	2	2	2	2	2	2	2	2	2
	• Back & Forward Links	2	0	0	0	0	0	0	0	2
	• Search facility	2	2	2	2	2	2	2	2	2
	• Index / Site map	2	2	0	0	0	2	0	2	0
5.	User Support Links									
	• Self explanatory links	2	2	2	2	2	2	2	2	2
	• E-mail helpdesk	2	2	2	2	2	2	2	2	2
	• Telephone helpline	2	0	0	0	0	0	0	0	0
	• Links to other websites	2	2	2	2	2	2	2	2	2
6.	Content Coverage Links									
	• General Reference	2	2	2	2	2	2	2	2	2
	• Creative Arts	2	2	2	2	2	2	0	2	2
	• Humanities	2	2	2	2	2	2	0	2	2
	• Language, Literature, Culture	2	0	2	2	2	0	0	2	2

	• Social Sciences	2	2	2	2	2	2	0	2	2
	• Life Sciences	2	2	2	2	2	2	0	2	2
	• Mathematics	2	2	2	2	0	2	0	2	2
	• Computer Science	2	2	0	2	2	2	0	2	2
	• Physical Science	2	2	0	2	0	2	0	2	2
	• Alphabetical listing	2	2	2	2	0	0	2	2	0
	• Country wise classification	2	0	0	0	2	0	0	2	0
	• DDC wise arrangement	2	0	2	0	0	0	0	2	2
	• Business Economics	2	2	0	2	2	2	2	2	2
	• Government Information	2	0	0	2	2	2	2	0	0
	• Maps and GIS	2	0	2	0	0	2	2	2	0
	• Links to other virtual libraries	2	0	2	2	2	2	0	0	0
	• Links to Search Engines	2	2	2	0	2	2	0	0	2
	• Databases	2	2	2	2	2	2	2	2	2
	• Links to E-journals	2	0	0	2	0	2	2	2	0
	• Directories	2	0	0	2	0	2	2	2	0
	• Magazines	2	0	0	2	2	2	2	2	0
	• News Papers	2	0	0	2	2	2	2	0	0
	• Education and Libraries	2	2	2	2	2	0	2	2	2
	• "About"	2	2	0	2	2	2	2	2	2
	• Visitor Number (Hit Count)	2	0	2	0	0	0	2	0	2
	Total	100	61	62	70	64	66	61	76	61

Table – 14 Ranking of Virtual Libraries

Rank	Name of the Virtual Library	Score
1	BUBL LINK	76
2	Internet Public Library (IPL)	70
3	Librarians' Index to Internet	66
4	INFOMINE	64
5	Livingweb Virtual Library	62
6	WWW Virtual Library	61
6	Virtual Library of Useful URLs	61
6	LIBRARYSPOT.com	61

BUBL LINK is ranked first with 76 points followed by Internet Public Library with 70 points.

11. CONCLUSION

(i) In moving from digitization to virtual reality, the most fundamental conclusion is that libraries can no longer be

considered in isolation. The Internet, the world's largest library, is a new competitor. But it is largely without the principles of collection development, a targeted audience and support services such as reference tools and reference librarians. If libraries can understand the values of users, and offer alternative, relevant and value added services, their future will be assured.

(ii) Libraries will continue to defy the predictions of their demise and to be a driving force in information storage and delivery long after the Internet is replaced by the next generation of information technology solution.

(iii) Although there are few virtual libraries presently in existence they are undoubtedly on their way.

(iv) The present virtual libraries are providing access to virtual indexes, catalogues and books but it will be necessary for future virtual library systems to provide other types of experience. These should include surrogate travel, learning scenarios and, may be, access to 'virtual librarians' who could help the users to find the information and experiences to which they wish to gain access.

(v) Creating virtual collections, maintaining this collection, retrieving the information from the virtual libraries and dissemination of this retrieved information through online services are the challenges of 21st century before the library professionals.

Suggestions

(i) Virtual library web sites should be well organized, provide statement about authority and should be rich in subject content.

(ii) The virtual libraries should provide maximum navigational links helping the users to browse the library.

(iii) Effective Online Help Desks should be created.

(iv) More and more general and subject virtual libraries should be located and a directory of virtual libraries should be prepared as a metadata.

(v) Like E-journals and Subject Database Portals, Virtual Library Portals should also be created.

(vi) In India, virtual library concept is in embryonic stage. Organizations like INFLIBNET, IITs, R & D Organizations should take up such projects.

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METADATA: AS A CONCEPT

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ABSTRACT

Many often the term 'Metadata' is referred and discussed in terms of the Metadata Standards. However, the concept is rarely described. In this article a metadata concept is discussed deeply with its definition, role, importance, and types with functioning. This will help to widen the knowledge about the concept that is frequently in use.

1. INFORMATION DISCOVERY

Finding and retrieving information (Arms, 2000) is central to libraries and searching for specific information in large collection of text or a single large text. It is known as information retrieval. This has long been of interest to information and computer scientists. Until the development of the web, browsing received less research efforts despite its importance. Large documents or meta documents in terms of Digital Libraries, bring information retrieval and browsing together in the general problem of information discovery – how to find information. Enormous amount of research are being carried out in this area; in terms of metadata, Natural Language Processing (NLP) and non-textual material such as; video; image recognition, speech recognition, specific content other than text.

2. METADATA AS A CONCEPT

'Metadata' has remained word under continuous discussion among researchers, computer scientists and library professionals. Metadata is data about data, a term that got wide prominence to denote cataloguing and representation of digital information resources. Daily increase in electronic information resources and Digital Library initiatives resulted into several projects. From the point of digital content and its access to the users, there are research efforts on relevant standards and numerous metadata formats such as Dublin Core, Text Encoding Initiative, Encoded Archival Description, Summary Object Interchange Format, Government (Global) Resource Description Format, etc. are in use. Metadata technological tools are claimed relating to the metadata aspects. The importance of the issue can be imagined from these efforts.

The terminology seems recently in use, however a concept is not new. Traditional practices of Libraries and Information Centres have been using the concept in terms of Alphabetical catalogues in library, Subject Headings, key wording, abstracting, Classification Numbers. Any glossary of words on any subject or dictionary and thesauri are very common examples. Data in terms of Descriptive Catalogues, Indexing is also not exception to these practices. There are equivalent traditional library standards include ISBN and ISSN (identification), Shelf mark/call number (location), ISBD and standards like AACR 2, Library of Congress (LC), Dewey Decimal Classification (DDC), Universal Decimal Classification (UDC), Colon Classification (CC), LCSH (Library of Congress Subject Headings), MARC (Machine Readable Catalogue) and other Cataloguing code. Study of these standards, and library professional practices are still a core subject part under Library and Information Science related courses. These aspects have remained very important useful to the library staff, information scientists and researchers. Any book consists of Content, Index; Bibliographic lists are also very good example of traditional practices of Metadata.

Dr. S. R. Ranganathan's Subject Index is still very important for Dubline Core Project. An end user article written by Aimee Glassel, Internet Scout Project's lead Internet Cataloger, expressing her views on the relationship between the work of S.R. Ranganathan, the famed Indian classificationist and librarian, and that of Yahoo! (http://www.yahoo.com) the online subject directory of Internet resources.

Above narration illustrates the importance of metadata. Not only it provides ease to researchers and scientists in searching appropriate documents, but also location details with substantive time saving in the process of search.

2.1 Importance of Metadata

According to William Arms (2000) the importance of the metadata is mainly for following aspects

2.1.1 Distributed Searching – Users often wish to find information that is scattered across many independent collections. Each collection may be organized in a coherent way, but the descriptive metadata will vary, as will the capabilities provided for searching. The traditional approach to finding information by searching across collections is to insists that all the collections agree on a standard set of metadata and support the same search protocols. Increasingly Digital Library researchers are recognizing that this is unrealistic. It must be possible to search sensibly across collections even if their materials are organized differently.

2.1.2 Interoperability – (The task of building coherent services for users from components that are technically different and independent by managed) Some of this metadata must be exchanged between computers. This requires agreement on the names given to the metadata fields and on the formats used to encode them, and at least some agreement on semantics.

2.1.3 Navigational Direction- *General Navigation* – Navigation (World Wide Web Working Group, 1996) consists of a request, a receive, and a display action. Each action interacts with a reference to objects or metadata for objects rather than to the objects themselves. A significant portion of the user's activity is navigation. For example, the user who finds a digital scrapbook in a repository may request a table of contents. Depending on the extent to which the book was processed, that table of contents may consist only of a stream of page references or of a nested list of chapter and section headings. In navigating the scrapbook, the user's navigation tool will

(i) request references (to pages listed by page number or to sections listed by section headings);
(ii) receive the references in a discernible format; and
(iii) display that information in a way that is meaningful for the user.

The user expects a series of references, not actual delivery of the objects, which will not be sent until requested.

Navigation also depends on an understanding of relationship primitives *parent*, *child*, and *sibling* that are the generic references a tool uses to facilitate navigation. The tool requesting, receiving, and displaying the parents, children, or siblings of an object that the user has located affects the navigation method. For example, to navigate a fully encoded and logically organized scrapbook, a navigation tool might request references to the first-level children in the scrapbook. A user would be presented with a list that looked like the following:

- dated entries
- accounting / budgetary data
- names and addresses
- itinerary

Each major heading may be presented as a link for further expansion, perhaps offering second-level headings to the user (for example, annual groupings of entries in the *dated entries* section). A threshold setting in the navigation tool may instruct the repository to send no more than *N* references at a time. Types of object references vary, depending on the type of resources, the amount of funding available to process the materials, and the programmatic or other purposes of an initiative. Examples include conceptual and structural references (as in the scrapbook example), simple page lists (such as Project Open Book and the University of Michigan Making of America sites), and pages of thumbnail representations of larger format images.

Image Navigation - In contrast to the generic form of navigation just discussed, image navigation uses image-specific information. Systems that display image

information need information analogous to that used in geographic references; for example, X and Y coordinates, along with dimensions of the portion of the image to be displayed. The image-navigation tool receives information about resolutions, resolution ratios, and window sizes to make the navigation possible; the image display tool uses that information to pan, zoom, crop, or otherwise use images.

2.2 Role of the Metadata

Howard Besser, (2000) describes the role of metadata as, "extensive metadata is our best way of minimizing the risk of a digital objects becoming inaccessible. Properly used metadata can –

- Identify the name of the work, who created it, who reformatted it, and other descriptive information
- Provide unique identification and links to organizations files, or databases that have more extensive descriptive metadata about this work. (This is particularly important in the likely event that the digital file and its external metadata become separated)
- Explain the technical environment needed to view the work; including applications and version numbers needed, decompression schemes, other files that need to be linked to it, and so forth

2.3 Types of Metadata

The Making of America (www.clir.org) Test bed Project, coordinated by the Digital Library Federation (DLF), is a multiphase endeavor. Its purpose is to investigate important issues in the creation of an integrated but distributed digital library of archival materials (that is, digitized surrogates of primary source materials found in archives and special collections). Drafted during the MoA II planning phase, this report identifies a starting point for the test bed that is being created in the production phase of this project, which is funded by the National Endowment for Humanities.

In 1998, the DLF, working with staff of the University of California (UC) at Berkeley, developed a grant proposal that requested support to create a test bed for its Making of America II project. The objective of the test bed was to move the DLF members and the wider library and archival communities closer to the realization

of a national digital library by addressing several issues that are critical to this goal.

The DLF systems architecture committee has identified three types of metadata:

(i) Descriptive metadata are used in the discovery and identification of an object. Examples include MARC and Dublin Core records.

(ii) "Structural metadata are used to display and navigate a particular object for a user. They include information on the internal organization of an object" (Rao, et al, 1991). For example, a given diary has three volumes. Volume I has two sections: dated entries and accounts. The dated entries section has 200 entries; entry 20 is dated August 4, 1890, and starts on page 50 of Volume I.

(iii) Administrative metadata represent the management information for the object, including the date it was created, its content file format, and rights information.

Metadata can now be added to the model. Any class of archival object encapsulates both content and metadata, where the metadata are used to discover, display, navigate, manipulate, and learn more about a particular object's management information.

Looking at the larger picture, there are three type of "metadata" which have been identified by the National Digital Library Project of the U.S. Library of Congress as being relevant to digital collections, (Gartner 1997), namely:

Descriptive metadata (such as MARC cataloguing records, finding aids, or locally developed practices for describing what the images are about);

(i) Structural metadata (the information that ties the images to each other to make up a logical unit such as a journal article or archival folder);

(ii) Administrative metadata (what allows the repository to manage the digital collection, such as scan date and resolution, storage format and filename)" The distinction among the three types of metadata is not absolute. For example, chapters are part of the structure of a book, but chapter headings may be indexed to aid in the discovery

of the item, thus filling one of the roles of descriptive metadata. In fact, the text of a book itself could be indexed and used for discovery.

While discussing this, it is necessary to understand the relationship among the metadata elements as shown in Fig. 1.

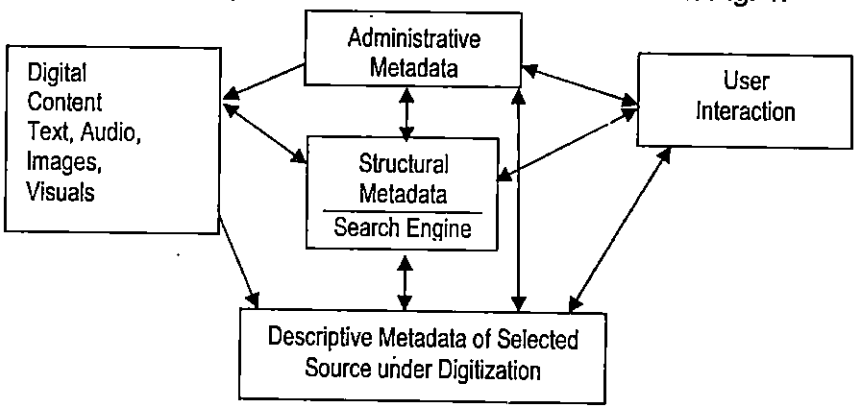


Fig. 1 Conceptual relationship of Metadata elements

3. CONCLUSION

Many times the term is referred and discussed in terms of the Metadata Standards. However, the concept is rarely described. In present article a metadata concept is discussed deeply with its definition, role, importance, and types with functioning. This will help to widen the knowledge about the concept that is frequently in use.

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NEED OF DIGITIZING ARCHIVAL RECORDS AND MANUSCRIPTS IN INDIA

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ABSTRACT

Human being has always been conscious of preserving his writings. Even the ancient civilizations like Assyria, Babylonia, Egypt, India, China, Greece, Rome etc. tried their best to preserve the official, literary and knowledge of other subjects on whatever form of writing they could find in their country. Origin of writing in India corresponds almost to the same period as was in other Oriental countries. Albeit innumerable manuscripts were destroyed by the invaders even then approximately one million manuscripts are still safe in Indian universities, manuscript depositories, private-institutions and religious places. Significant role by National Archives of India, State Archives, and National Mission for Manuscripts is being played in preservation, restoration and digitization of manuscripts. We are now passing through electronic age and heading towards virtual libraries and archives. Albeit much has been done for the libraries the entire world over yet a lot is to be done for archives, manuscripts and rare documents. Old manuscripts and records on leaves of trees, bark and paper are fighting a last battle to survive. Electronic/Information Technology has come to its rescue so that these valuable documents could be saved for posterity.

Albeit there are a number of problems like metadata, authenticity, online-availability, security, reliability, permanence etc. in the digitization yet the information/ computer scientists and archivists are trying for universally acceptable software and other standards.

1. INTRODUCTION

Oriental civilization's contribution to the world will always be remembered in history. Ancient scholar's knowledge of various subjects is still useful though to a limited extent. However, it is rare, unique and valuable. India which has been continuously attacked by various invaders has lost a lot of literature yet still we have a large number of manuscripts and other writing materials which are safe these days yet need proper care and preservation. In Oriental countries in the present scenario the forms of preserving information available in untraditional medias has compelled the archivists and librarians of manuscript libraries to think of electronic forms. The question arises whether it will be safe and suitable as the paper has proved. We are heading towards paperless society, virtual library and virtual archives.

Concept of maintaining records was considered by the kings and officials even when only primitive forms of writings were available. Even the clay tablets had official information which was put in envelopes which were also made from the clay. "These were sealed with a certain mark in order to avoid any forgery" (Chopra, 1996).

It is generally agreed that archives have been in existence among the Oriental peoples, and among the Greeks and Romans since the written word came into common use. Surprisingly, archives were known to Hittites, Assyrians, Medes, Persians, Babylonians and Egyptians (Hooker, 1990). In India approximately one million manuscripts are available in manuscript libraries, educational institutions, religious places etc. A significant number of Indian manuscripts are also available in Denmark, France, Germany, United Kingdom, Nepal, Pakistan and Sri Lanka. In addition to it, excavations in Central Asia have brought into light several manuscripts of Indian origin (Project Document, 2002).

Even in Tibetan and Chinese manuscripts there exists Indian philosophy. Most of these translated manuscripts were carried to their countries by scholars as well as travellers of these countries during ancient times. NMM (National Mission for Manuscripts) will have to work in this direction also (Project Document, 2002).

Gilgit manuscripts, which cover monastic disciplines, medicine, tantra etc. of 6th century A.D., are some of the rarest specimens of written documents on birch bark (Project Document, 2002).The manuscripts which are wealth of knowledge belong to the last

5000 years. These manuscripts are in different languages and scripts and on different types of writing materials like palm leaf, birch bark, wooden boards, cloth, stone, rocks, paper etc. In India in addition to National Archives, we have also twenty seven state archives which house millions of valuable papers, manuscripts etc (Low, 1969).

Preservation of these old, rare, brittle and fragile manuscripts is the national problem. Till today there is no comprehensive catalogues of all the Indian manuscripts. Scattered attempts are of course there. Individual efforts on the part of manuscript libraries, universities and colleges have been made to prepare the catalogues.

Role of National Archives of India and Indira Gandhi National Centre for the Arts (IGNCA) is significant though they are working only to a certain extent. The archival records are very useful for various subjects particularly for the study of history and historical facts of a particular period. Among all records being created in our public, semi-public and private organizations, paper-records still form the most common medium. Archival material is not ephemeral or tertiary, therefore, it cannot be allowed to perish or deteriorate. Every information must be available to the scholar, user or government. Thus accessibility, availability and permanence are the major factors to be considered. Like archival records rare books and manuscripts are also an integral part of our cultural heritage. If there is a loss of one manuscript it means an irreparable loss to a certain subject, religion or country.

Of course there is difference between the paper records and electronics records. Albeit the information will be the same yet mode of putting information on computer is different. It will require knowledge of software, hardware, access points and training to digitize documents. In case of Manuscript on paper the only requirement is ability to read the language in which the information is recorded on paper. In case of computer, data will be in an electronic form i.e. machining readable form (Kapoor).

During ancient as well as modern time's change of ink or handwriting were the major clues in forgeries on paper manuscripts or documents. Question arises whether the information stored in electronic media is safe or not'. Is it very easy to change, delete or add any information in the text without leaving any clue to be detected? Hackers' malicious designs of spreading computer virus are well known throughout the world.

Electronic records, however are replacing paper as the preferred means of storing archival information. Electronic records are not different in nature from their paper counterparts. They need to be recorded and captured in such a way that they are authentic authoritative, reliable, purposeful and universally acceptable. Information should be maintained in such a manner that the records remain available, understandable and useable for a pretty long period (Kapoor).

Generally, technology provides alternative to the traditional methods and procedures. It enables to do things better, faster and effectively. New information techniques will naturally find some reliable solutions to the digitization of records and manuscripts. The archivists will have to identify the records, proper indexing, access points, abstracting of information records, use of electronic media for preservation, etc. This information will not be physically with the scholar. The electronically converted records may be made available to him. He can see the contents on the screen. Closely associated with electronic records is the question of their integrity, authenticity and non-repudiation (Kapoor).

They should have control over creation of records: ensuring that the records are authentic, trustable, and perceivable. Here the archivists will have to establish guidelines to define the functioning of the Department, so that they can work effectively with certain specifications from a range of disciplines as well as with record creators themselves. In order to have proper intellectual control over the archival records one must have proper knowledge of originating body and its functions. Before putting the records in electronic form there must be complete analysis of records to help the user to reach the right information.

With the change of mode of preservation of information the old set of rules to handle the records are proving useless in the new scenario. Change has affected economic, social, educational and cultural life of Indian people. Thus archival records, in coming days will be in digitized form, and dispersal of information will be through different modes. CD ROMS, Scanners, Multimedia and Computer files will come to the help of the user.

Transitional period through which India is passing is always full of chaos regarding status of information on paper as well as computer. During such a period the staff as well as the user prefers to consult the records in conventional form. In addition to some universities and institutions in foreign countries which are

working for better information technology for archives and some companies such as Provenance, Public Sector Systems, TRIM and other have entered the market with products designed to respond to the requirements of archives (Singh).

Generally some over enthusiastic information scientists are of the opinion that paper is fighting the lost battle against the electronic media. Different scholars give different views on this aspect. There is no complete disownment of paper even in the developed countries. In developing as well as poor countries paper is being frequently used along with electronic media. However, maximum use of electronic media is being made to make things easy.

So far as the preservation of records and manuscripts on paper is concerned it is not so difficult. However, conservation as well as restoration is well known to the archival staff. In order to save the old paper documents de-acidification, fumigation, lamination, encapsulation, repair, proper control of environment and biological factors etc. are some of the popular techniques.

So far as preservation of records and manuscripts in computers is concerned it needs a standardized room temperature which the State archives, Manuscript depositories are not in a position to afford in India. According to a general belief the electronic records can be safe only for twenty five years which is a very short period in comparison to the longevity of good paper. Because of high cost of acid free paper in India the publishers avoid to use the same. Change in computer technology is very fast. During the last few years four models of computer have appeared in Indian market which exhibit extraordinary rapid change. However, quick replacement is unaffordable for the universities and other academic institutions in India (Singh).

The scholar or the archival official can see the structure of record on paper but in electronic media it is invisible and text can be seen only on the screen. Thus in electronic media any defect can delete the information which no archive can afford. For regulating creation, maintenance and disposal of records the appropriate management, disciplines, rules, and procedures need to be formulated. The users expect same degree of reliability as it is available with the paper records. Another important element in the electronic records is metadata i.e. data about data' paradoxically the electronic record seems to exist merely because there is metadata or contextual information about it. If we do not have the requisite information, we will be unaware of the existence of

record. Undoubtedly it is yet to achieve that the electronic records of archives are available on online and accessible to everybody at everyplace. We are heading towards UNESCO's concept of 'information for all', thus after some time information on database will be accessible throughout the world. Like virtual library there will also be virtual archives. In such situation the archivists will be faced with issues of privacy and security of information.

Archivists must develop new standards for processing information and learn to make new technology work for them, particularly for safeguarding valuable information. Steps will have to be taken by the computer engineers to safeguard the new tools of information i.e. Computer tapes and disks which quickly deteriorate. In the present scenario there is a lack of systematic and planned creation of records. Electronic information is being created and received without being subject to rules and procedures governing good record keeping. The archivist will need record of all the users who hit or consult the information site on the internet. Preservation of e-mail addresses is necessary for or any enquiring record. Data of the archives is very complicated moreover; it can be used from various access points. Therefore, the information scientists should preserve both data and formula. A hypertext document with many links can be very useful (Kapoor).

The archivist will have to be vigilant about the activities of the archives keeping in view the modern information technology. When the archive is to be handled physically the record creator knows its intricacies and the demands of the users. However, in case of electronic records, the programmer will have to prepare the system at designer's stage. So far as records management system is concerned paper records are subjected to appraisal after they become non-current. But in the case of appraisal of electronic records it has to be decided at the conceptual stage. For deciding in advance about appraisal of records functions of the originating body, and the business processes and activities through which business is carried out has to be taken in account, rather than records themselves (Singh).

A significant number of important manuscripts are in the possession of individuals throughout the country. Their unwillingness to gift or sell to the educational institutions may prove harmful to the safety of manuscripts and a big loss to the nation. The individuals possessing manuscripts need proper knowledge of preservation and conservation which is not available in India because of its poverty. Before National Mission for

manuscripts no significant attention was given to the problem of manuscripts which directly relates to cultural heritage of India. Microfilming of manuscripts in certain universities and institutions is already in progress. Digitization is the latest technique to preserve the manuscripts along with illustrations and illuminations. However, software, hardware technology of computer is changing very fast. We are not sure that by making huge investment we will be able to preserve the manuscripts and archival records for future generations or not.

If the records of archives, rare documents, or texts of manuscripts are made publicly accessible then there is doubt about the maintenance of authenticity of the text. Downloaded information can be changed, deleted or substituted by any unscrupulous element. To avoid any hacking attempt the archives or manuscripts libraries should have more than one original database. Until there is no complete security of the text, records on paper and original manuscripts should be preserved according to the latest conservational techniques.

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ROLE OF COMMUNITY INFORMATION CENTRES & LIBRARIES IN DIGITAL ENVIRONMENT: A STUDY OF MANIPUR STATE

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ABSTRACT

The paper discusses the major role of Community Information Centres and libraries and its impact on the user community in the state of Manipur. The paper highlights the overview of digital library service environments and the possible role of libraries and Community Information Centres in the digital era. An attempt has been made to study the access to digital information by the peoples in the rural areas of Manipur State. The paper also analyzed the need to know more about how new technology initiatives fit into local level to meet the needs and expectations of local users or communities for preparing and powering the masses for the construction of digital knowledge based society. Majority of the respondents showed their willingness to receive IT based digital library/digital information service centre for the required information in the emerging IT and digital networks environment.

1. INTRODUCTION

Today, the world is shrinking and increasingly becoming a tightly knit global village. The libraries and information centres are the by products of modern information explosion, the advancement of information technology system the libraries and information

centres seemingly ubiquitous nature of the Internet and take advantages of new information technology, which allow us to retrieve, access, store, disseminate information. It is highly likely that this century will witness a global digital century, through which collections in different parts of the world could be accessed and shared digitally.

The explosive growth in networked connectivity and rapid advances in computing power the location and provision of information services has dramatically changed over the last decades. There is no need to leave the house or office to locate and access information now readily available on-line via digital gateways furnished by a wide variety of information providers (e.g., libraries, information centres, electronic publishers, businesses, organizations, individuals). Information access is no longer restricted to what is physically available in the nearest library and information centre. It is electronically accessible from a wide variety of globally distributed information repositories.

Information is no longer simply text and pictures. It is electronically available in a wide variety of formats, many of which are large, complex (i.e., video and audio), and often integrated (i.e., multimedia). This increased variety of information allows one to take virtual tours of museums, historical sites and natural wonders, attend virtual concerts and theater performances, watch a variety of movies, and read, view, or listen to books, articles, lectures, and music, all through digitally or electronically. Technologies especially computer and telecommunication have greatly revolutionized in the field of library and information centre giving rise to a new aspect called "Digital Library" or "Digital Information Service Centre".

2. OBJECTIVES OF THE STUDY

i. To identify, study and evaluate existing libraries and information service centres in the state of Manipur;

ii. To study the major role of Community Information Centres & Libraries in Digital Environment;

iii. To study and examine the impact of ICT on user community;

iv. To examine the access to digital information and needs of digital information service centres by the user community;

v. To study the people have knowledge of IT, access to digital information, computer literacy, information literacy and if not the problem faced thereby; and

vi. To highlight the overview of the digital library service environment and willingness to receive IT based digital information services by the user community.

3. METHODOLOGY

For the present study a questionnaire was designed for the user community of the Community Information Centres (CICs) and Libraries (along with the one questionnaire for each and every service centres of CICs & Libraries) and distributed during 2003-2004 and surveyed the centres situated at valley districts of Manipur State. It covers 670 persons through simple random sampling method; of the 670 questionnaires distributed 398 were received. The data thus obtained were analyzed to draw the conclusions.

4. OBSERVATION

4.1. Infrastructure

The existing infrastructure built at the information service centres is very poor, excepting a few centre lacks of computer and Internet facility. It is found that, the libraries are not providing computer and its IT facility. Whereas the community information centres are providing the computer and Internet services with the application of emerging IT facility. The majority of the users were use to access digital information and its resources from the community information centres. It is strongly felt that computer and Internet facility should be made available to all the information service centres particularly the libraries. Table - 1 indicates the existing information service centres in the State of Manipur and it showed that the information service centres in the rural areas are very few, almost negligible in number.

Table - 1 Distribution of the existing information service centre

Sl No.	Name of the centre	Total no. of centre in the State	Existing centre in valley districts	Location	
				Rural	Urban
1	Public Library	9(1SCL, 6DL, 1Net.Lib, 1Branch Lib.of SCL)	4 (out of 9)	Nil	4
2	Information Centre	10 (1SIC, 9DIC)	5 (out of 10)	Nil	5
3	CIC	33	11 (out of 33)	2	9
4	Informatics Centre	8 (1SIC, 7DIC)	3 (Out of 8)	Nil	3
	Total:	60	23	2	21

* 1SCL ≙ One State Central Library; 6DL = Six District Library; 1 Net. Lib. = One Netaji Memorial Library; 1 Branch Lib. of SCL = One Branch Library of State Central Library; 1SIC = One State Information Centre; 9DIC = Nine District Information Centre; 1SIC = One State Informatics Centre; 7DIC = Seven Districts Informatics Centre and 33CIC = Thirty-three Community Information Centre.

4.2. General Overview: User Study

Of 670 questionnaire distributed, 550 questionnaire were for CICs and remaining 120 questionnaire for Libraries which covers 11 nos. of CICs and 4 nos. of libraries situated at the different locations of the valley districts of Manipur State. Of 550 questionnaire distributed 335 were received back from CICs which amount to 60.91%, whereas, out of 120 questionnaire distributed 63 were received back from the libraries which amounts to 52.5 % as shown in the following table.

Table - 2 Distribution of questionnaire to the Library & CICs and their responses

Sl no.	Name the centres	No. of questionnaire Distributed	No. of questionnaire received back with percentage
1.	Library	120	63 (52.5%)
2.	CICs	550	335 (60.91%)
	Total:	670	398

4.3. Opinion about the access to digital information & its resources by the rural people/local Users

The respondents are requested to indicate their awareness about the use of IT, knowledge of digital technology and how to access digital information by the people and their needs of digital information, whether the libraries and information centres are providing need-based information services to meet the needs and expectations of local users or not. Table - 3 indicates, 40.70 % of respondents were having the knowledge of IT, computer handling and Internet access. 72.11 % of respondents showed their willingness to receive IT based digital information services and 63.32 % of respondents did not aware about the digital technology and its resources) and were not to access digital information at the right time for the right information.

Table - 3 Use of IT, access to digital information

Sl. No.	IT Based Services	No. of respondents with percentage		(Total %)
		Yes	No	
1.	Awareness of computer handling, Knowledge of IT and Internet access	162 (40.70 %)	236(59.30%)	100%
2.	Knowledge of digital technology, Access to digital information	146 (36.68 %)	252 (63.32%)	100%
3.	Willingness to receive IT based Digital information services	287 (72.11 %)	111(27.89%)	100%

4.4. Impact of ICT on user community

Table - 4 showed that, out of the total respondents, 48.99 % of respondents are not able to get the ICT facilities at the local level. 26.38 % of respondents of users those who are lack of awareness about the new technology and are not aware the term 'Information', 'Information Literacy', 'Computer Literacy' etc. And 70.10 % of them are interested to use the new technology and use to access digital information and its resources available in those centres. Majority of the respondents has suggested that, ICT facilities should establish, develop, implement and well organized information network system is very much essential for the

development of the local user communities to bringing a knowledge oriented or information oriented society.

Table - 4 Impact of ICT on User community

Total no. of Respondents	No. of respondents those who were interested to use ICT facilities (%)	No. of respondents those who were lacks of awareness in ICT(%)	No. of respondents those who did not available ICT facilities (%)
398	279 (70.10 %)	105 (26.38 %)	195 (48.99 %)

Note: Percentage is more than 100 because of multiple choices

5. ROLE OF LIBRARIES AND COMMUNITY INFORMATION CENTRES IN DIGITAL ENVIRONMENT

In the Digital era, everything is electronic. Considering the importance of information to our academic purposes and our day-to-day work, there is great need to start efficient information dissemination services in libraries and community information centres (CICs), by identifying information needs of the users. Taking into consideration the library and CIC as a service oriented centre, the application of IT in library and CIC services and operations would serve well. Libraries and CICs will have to at least collect, organize, access, store and disseminate materials of purely local interest for their user communities. Digital libraries will have to subscribe to book and periodicals in electronic form and the libraries will and still play a role in making materials accessible free or at low cost. For one thing, it seems reasonable to assume that some type of library will be needed to provide online access to individuals, who for one reason on the other do not have their own terminals. The library and CIC will be a centre in which access to world wide databases and databanks will be possible.

The multimedia, through imaging technology and networking can be effectively used for library management, database transportation and collection exhibition. Libraries has play a vital role to recognize this potential of digital imaging for enhancing the coverage and improving the efficiency of the user service.

Librarians will continue to play a crucial role in collecting, cataloguing, indexing and retrieving of information, despite the pattern of information transfer and processing becoming complex.

Digital library spacing requirements will be reduced drastically. In order to provide services, they may need a few highly trailed personnel who can procure materials in digital form, create specialized indexes, searching tools etc., and assist users in: searching indexes effectively and efficiently; searching network databases as intermediaries; education and training of new users; adhering to copyright rules and regulations; procure required documents for the local database and process them to suit local requirements.

The real challenge to library roles in a digital environment will be for those libraries which have offered services to the general public—like public libraries – or to a large part of the public- like to the students by an academic library. We must differentiate clearly between the role and activities of libraries on the one hand and of librarians on the other hand- now and in the future. We can predict a digital environment information society in which libraries or the skills and competence of librarians will be highly valued. But this does not necessarily mean that there is an important role for libraries to play in general or for special type of libraries. Libraries or the competence of librarians, transformed into something slightly different or nearly similar, in the digital environment will be of interest to all kind of information of knowledge industries and activities- private or public.

The Community Information Centres (CICs) is also one of the such centre which will provide various facilities regarding to the IT based information services, internet access, computer education and training programmes, distance learning, information exchange, resource sharing and networking, dissemination and communication information, information on weather, advertised and sales of rural agricultural products, e-governance, e-learning, e-business etc.

The CICs has play a vital role to provide various information with the emerging Information and Communication Technology (ICT) facilities regarding to the needs and expectation of local users or communities. Moreover, at the CICs, there is little need for the type of information that is widely available on the Internet by the use of modern Information Communication Technologies. Although the farmers and other villagers who visit the centres do have access to the Internet, the material they need is to be far more localized. Accordingly, rather than simply providing access to the Internet, the information centre may construct (and update

on a frequent basis) databases of local information, usually in local language for the benefit of local communities.

6. DIGITAL LIBRARY SERVICE ENVIRONMENT

A Digital Library Service Environments'- 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, films and sound recordings are as visible in the digital library service environment as are online catalogues, finding aids, abstracting and indexing services, e-journals and e-print services, digitized collections geographic information systems, Internet resources and other electronic holdings.

In constructing a digital library service environment the library becomes responsible for configuring access to a world of information of which it owns or manages only a part. The digital library service environment is not simply about access to, and use of, information. It also supports the full range of administrative, business and curatorial functions required by the library to manage, administer, monitor engagement with, and ensure fair use of its collection whether in digital or on- digital formats, whether located locally or off site. The digital library service environment integrates (and interfaces with) information repositories that are characterized by open-access shelving, high-density books stores, and availability via interlibrary loan, and include data services and digital archival repositories. It manages information about collections and items within collections often throughout their entire life cycle. The digital library service environment may also evolve into a networked learning space, providing access to, and a curatorial home, for, distance and life long learning materials. The digital library service environment is, in sum, an electronic information space that supports very different views and very different uses of the library.

It is designed for the library's patrons as well as for its professional staff and with an eye on the needs and capacities of those who supply it with information content and systems. It is built in the full knowledge that information technologies will continue to change rapidly as will our understanding of how they can be used to support and cultural engagement. Finally, it is evolving as the

library's defining function and as such is developed with a view to its financial and organizational sustainability.

7. IMPLIED SUGGESTIONS

The view and comments offered by the user community / rural community have enabled the investigators to offer some feasible suggestions for achieving optimal services of the centres. They are given as followings:

i) The present study has seriously considered the lack of proper library and information service centres at the village level; local user community/local people are not getting / aware of the information of their needs, this will lead to the slow development of the rural mass. Hence, it urges the state government to implement the Manipur Library Act, which was passed in 1988.

ii) The network would progressively have to be extended to all the villages or at least the larger villages for the promotion and motivation of the peoples to use and access information whatever they required. The type of Community Information Centre developed by the M.S. Swaminathan Research Foundation (MSSRF) in select villages in Pondicharry; Multipurpose Community Telecentres developed by the International Telecommunication Union (ITU) in rural areas of the Rajkot District of Gujarat and Chattopadhaya Committee on National Policy on Library and Information System (NAPLIS) can be used as an example

iii) Extensive IT awareness programmes would have to be extended at the village level through library and community information centre.

iv) There should be a wider and effective programme to make the citizens not only traditionally literate but also information literate. It is suggested that the different educational institutions and government agencies of the state can provide all the technical skills necessary for the creation and management of the IT based 'Digital Library' or 'Digital Information Service Centre' in the state of Manipur.

v) It is suggested that the information centres, community information centres, libraries etc. should have content

preparation programmes including continuous updation based on new technologies. Content preparation requires the knowledge of the subject, knowledge of the concerned rural areas so as to make the content area specific, knowledge of the local dialects and the terminologies used so as to communicate better and the basic knowledge of creation of multimedia packages.

vi) Content transmission at this stage that the Internet and the computer come into the picture. The Community Information Centres and Libraries will be enabled to log on to these institution websites for the different information of their needs and content packages can be made available from the web site or on line or through CDs/CD-ROM.

vii) State Institutes of Rural Development (SIRD) and Directorate of Science & Technology should be strengthening, and National Institute of Rural Development (NIRD) is an apex and all the rural development libraries at the base should form a pyramidal structure of grid system. Further, all the educational institutions, research centres, public libraries, information centres and community information centres should also integrate their coordination and cooperation with the village libraries at the local level. This will build the infrastructure in the rural areas and state as a whole.

viiii) Library professionals should themselves join hands to come forward to improve the library services with the help of emerging ICT applications.

ix) A Legislative Forum, comprising the legislators and library leaders be constituted to create a clear vision plan for the electronic library system in rural areas of state and country as a whole.

x) Government should pen down a State Policy of Library and Information System and State Information Literacy Policy, to make knowledge based society and where information should reach to all the section of the society.

8. CONCLUSION

The development of technical infrastructure and access to digital resources within libraries and information centres is a vital trend for success in the future. Libraries and information centres have

always been about information management and although the format of the information changes, the library and information centre will be the best place to manage it. In the Digital Information Age/ Digital Environment, libraries and information centres have been seen a series of changes over the past decade with the movement of information resources and funding opportunities from the physical to electronic programmes and improved funding technology-based projects.

By adopting the above road map the investigator strongly felt that libraries and community information centres of the state can play a major role in bridging the information gape for the rural population of the state in this era of IT and digital environment, using computer and internet, they can transmit locally relevant knowledge and information in all areas such as education and training, agriculture, small scale industries, live stock management, water management, waste management, health, career guidance employment and job opportunities etc. to different population segments in rural areas and state as whole. While conducting the survey, it is strongly felt that the needs of the user community is to be identified carefully, according to required information are to be made available with the help of new emerging technologies. So, majority of the respondents needs more IT based digital library and digital information service centre to meet the needs and expectations of local users or communities for preparing and powering the masses for the construction of digital knowledge based society in the digital environment.

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ROLE OF DIGITAL LIBRARIES IN THE ELECTRONIC INFORMATION ERA: ISSUES AND CHALLENGES

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ABSTRACT

Paper contains brief description of Digital Libraries and has dealt with the methods of building digital collections and use of Digital Libraries and the problems faced by digital libraries, its impact on education and libraries. Some main issues and challenges in creating digital libraries have been discussed in the paper.

1. INTRODUCTION

The modern library is the interface between users and the vast amount of published unpublished information available. The user comes in, gains access to the information by means of inspecting the holdings of library or by means of inter library loans or a document supply service if the material is not available in the said library. In the Electronic world, the scene is more complex, because the possibilities for direct contact are far greater. A user may deal directly with a publisher or an author. The digital library offers the prospect of access to electronic resources at their convenience temporality and spatially. Users need not have to be concerned with the physical library hours of operation, and users need not have to go physically to the library to access resources.

The electronic or digital library is just beginning to take shape through out the world, including the world of libraries. Electronic libraries are often labeled "Libraries without walls" because they rely on their connection to other libraries information centres and sources of data that are not physically with in the library itself.

A digital library is a distributed technology environment, which dramatically reduces barriers to the creation, dissemination, manipulation, storage, integration and reuse of information by

individuals and groups. Information sources accessed via the then Internet are ingredients of a digital library. Today, the network connects some information sources that are a mixture of publicly available information and private information shared by collaborators they include ref volumes, books, journals, newspapers, national phone directories, round and voice recordings, images, video clips, scientific data, and private information services such as stock market reports and private news letters. These information sources when connected electronically through a network represent important components of an emerging University accessible, digital library.

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 communications machinery together with software needed to reproduce, emulate and extend the services provided by conventional libraries based on paper and other material means of collecting, storing, cataloguing, finding and disseminating information. A full service digital library must accomplish all essential services of traditional libraries and also exploit digital storage searching and communication.

We are amidst an information explosion and information technology, revolution leading to the emergence of electronic information era. Rapid advances in information processing storage and communication technologies have revolutionized the role of worldwide libraries in disseminating information services to their users. As a result libraries are facing new challenges, new competitors, new demands, new expectations and variety of information services from users tailored to their wants and needs. Libraries are incorporating new technologies, upgrading information resources, training people, changing information objects, modes of communications and information delivery in order to add value to their services and to satisfy the changing information needs of user community. Information seekers are no longer satisfied with old printed materials. They wanted to supplement the printed information with more dynamic electronic multi media documents. The user's demands for information delivery in digital form of their desktop are increasing in recent times, in the present environment, where there is a wealth of information resources being published and transmitted through electronic media. Libraries must take protective measures to

develop digital collections to cater for digital information needs of their users.

2. BUILDING DIGITAL COLLECTIONS

The success of a digital library depends largely on the nature, content and quality of its digital collections. The basic requirement in creating digital library will be the building of digital collections. The digital collections of information include various resources such as electronic journals, books, full text, CD ROM databases etc. Both library professionals as well as users have recognized the benefits of information collections in digital form for preservation, access and managing large quantities of information. There are essentially three methods of building digital collection.

(i) Digitization: The Primary method of building digital collection is digitization. Digitization means conversion of any fixed or analogue media such as books, journal articles, photos, paintings, and microforms into electronic form.
(ii) Acquisition of original digital works created by publishers' agencies and scholars.
(iii) Access to external materials not held in house by providing pointers to web sites, other library collections and publishers servers.

Digital libraries can store large volume of information in digital form for archival management. It providers users with immediate access to the rapidly growing information stored in digital form. It provides users fast access to multimedia information quickly and interactively through the integration of technologies. It offers remote access to expensive and special collections of information from many locations by many simultaneous users. Protection of old rare ad unique documents for posterity is an important function of any library many of the books published in the 19th Century and in the first decade of 20th Century are exposed to destruction through acid components of paper. The digitization of those collections is the saving solution to fight against the acid paper decay and to make research materials available in digital form, which is needed by researches and is very rare, valuable and is not easy to obtain in their traditional paper form.

Digital libraries offer new dimensions of easy access to their resources when information materials are in digital form and

stored electronically on digital media. They can be used and reused for any suitable purpose. As long as the resources are in digital form regardless of weather they are still images, video or sound and are on web server. One can obtain this information almost instantly from any where in the world. The key functions of digital library are. It manages large amounts of digitals contents of information, preserves unique collections the rough digitization, perform searches, which are impractical manually. It protects content owners information, it improves access to information. It deals with the data from multiple locations and in addition enhances the distributed learning environment.

3. IMPACT ON LIBRARIANS

The emergence of digital libraries raises the question of whether, and to what extent, will the traditional intermediary functions disappear be replicated or transformed, some librarians feel that their value as professionals will be diminished as digital libraries supplant those filled with physical books and periodicals. Many librarians fear that the public will by pass them and go directly to the source of information via the Internet. But their fears are mere misconceptions as "Computers only manipulate numbers. It is the people that connect them to meaning. Libraries provide context to users. Even as the stuff of library collections begins to change and become collocated in the private digital libraries of publishers and content owners, the value of libraries who can effectively turn mere data into knowledge will be paramount". Librarians will continue to play an important role in the digital era as they have particular knowledge and expertise in knowledge transfer. The only need is the willingness on the part of the librarians to adapt skills relevant to the digital environment. Librarians will have to develop skills of information analysis and synthesis.

Apart from playing the role of information brokers, the librarians can also start content development activities. Content creations and development is recognized as important activity in the digital environment. According to peters, there are several areas in which today's information professionals can develop new skills. They must form strategies in order to change, survive and continue to compete in the world of electronic information.

4. IMPACT OF DIGITAL LIBRARIES ON EDUCATION

Libraries serve at least three roles in learning. First they serve a practical role in sharing expensive resources, physical and human

resources support instructional programs by responding to the requests of teachers and students. Second, libraries serve a cultural role in preserving and organizing artifacts and ideas. Third libraries serve social and intellectual roles by bringing together people and ideas. Digital libraries extend such interdisciplinary by making diverse information resources available beyond the physical space shared by groups of learners. One of the greatest benefits of digital libraries is bringing together people with formal, in formal and professional learning missions. In addition to expanding the formats of information (e.g., multimedia, simulations) digital libraries offer more information than most individuals or schools have been able to acquire & maintain.

5. ISSUES AND CHALLENGES

The highest priority of a library, digital or any other is to serve the research needs of its clientele. The development, maintenance and extension of its collection and its technologies must be supportive to this primary objective.

i) Users only locate the information; which is not usually structured. There may not be any control on the information that is made available.

ii) Traditional library schools curriculums have tended to be too conservative both in the context of broadening the knowledge and application of information technology. Theoretically speaking, the modalities of curriculum especially in India, is in dilly dallying portion except in few exceptional cases. The emphasis should now to take a fresh look at the curriculum in the digital technology environment.

iii) Training and Development opportunities for librarians and end users for optimal utilization of digital innovations are to be encouraged and revitalized.

iv) Importing of technology has been a great barrier until recently, but it is being gradually simplified because of liberalization programmes of government.

v) Specialized technologies are needed for compressing as well as for organizations of information. Database management methods extended, relational or object oriented, are needed not only to support direct use of data collection in digital library but also to handle catalogues and other services.

vi) When there are budget cuts in the organization, information services and libraries are often among the earliest victims. The down sizing of digital devices under such circumstances

is depressing and technology switch over may seem to be bleak. The organizational viewpoints need some inclusive resulting towards the digital library concept.

vii) Security shocks are the most pressing challenges of digital affairs. Privacy of database, copy rights infringement, virus invasions, parallel satellite, networking stresses are some of the issues for digital libraries to be confronted as a way of routine.

viii) Creating digital libraries poses serious challenges, because of the unique nature of digital information, it is less fixed, easily copies, and remotely accessible by multiple users simultaneously.

ix) One of the largest issues in creating digital libraries will be the building of digital resources. Obviously for any digital library to be viable, it must eventually have a digital collection.

x) The first and foremost concern is what right one has to digitize for any published document. It depends on the publication date. Generally anything published at least 75 years ago in now in the public domain. For most published material, one must receive publication permission from the rights holder. Generally speaking, it is less costly to get permission to digitize unpublished or out of print material, but costs very widely. Therefore one has to check, whether the document is protected by copyright and whether the copyright is available easily and preferably at no financial cost.

xi) Another issue is preservation. Keeping digital information in perpetuity, the digital storage media such as hard disks, tapes and floppy disks have a very short life span due to rapid technological obsolescence. The media used to store digital information become obsolete in anywhere from two to five years before they are replaced by better technologies.

6. CONCLUSION

In future, libraries, if they are to survive and succeed, have to change their role from store house of fixed printed materials to the digital libraries of dynamic electronic multimedia documents in order to satisfy, the changing information needs of the users National and International support, collaboration and cooperation is essential for the development of digital libraries. In view of the new trends in information transfer, the challenge is to cope with the changes in digital accessibility and optimize the value of information to the organization, to society as a whole and to the

individuals that comprise both. Finally, digital libraries rest upon, basic human need for timely and relevant information, advances made in net working, information storage and retrieval and changing characterization of the users, authors and publishers. For this we have to keep in mind the different issues and challenges involved in creating digital libraries.

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ROLE OF INFORMATION LITERACY IN MAXIMIZING THE INFORMATION USE IN ACADEMIC LIBRARIES

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ABSTRACT

Information has become more complex and expensive. The traditional services, such as Selective Dissemination of Information and Current Awareness Service, need to be supplemented by 'Selective Elimination of Information'. The evaluation of information to separate the quality information from junk is the need of the hour. In this context, the basic challenge is to convince and convert traditional users into users of Internet based resources and services. Information literacy can contribute to developing the information skills needed to handle the Information Technology use by the end-users. Information Literacy empowers the ability to access, evaluate and use information by the individuals in the information society. To use information effectively users need to master the skills of finding, handling, evaluating and using it because it is scattered in print, electronic and digital forms and formats.

This paper describes briefly the information literacy skills and their role in maximizing information use in academic libraries. Given an opportunity for elaborate information literacy instructions it is envisaged, that the library users from the very beginning of their academic careers, adopt a critical approach to information and develop the ability to

evaluate the information they encounter for authenticity, accuracy, readability, authority, relevance, concealed bias, logical inconsistency and so on. Further this paper has made an attempt to conceptualize the information literacy within the structures and modes of thought of academic disciplines.

1. INTRODUCTION

Academic librarians and academics are becoming increasingly aware of the need to provide learning programmes that develop student's information literacy and many examples of information literacy programmes are documented. This is because the skills of analysis, evaluation and synthesis are the hallmarks of good education. The information handling skills and information technology skills are necessary for students to solve the information problems faced by them in the changing information environment. Students need to be information literate to make maximum use of wide variety of available sources of information. An information literate student can effectively access, evaluate, organize, synthesize and apply information drawn from different sources and in different formats in a variety of contexts. Critical, rational and creative thinking, the ability to manage and retrieve information and effectively communicating the information also need to be mastered by students.

The shift from 'user education' to 'information literacy' is due to proliferation of electronic/digital information resources. Information literacy includes all other illiteracies basic literacy, visual literacy, media literacy, digital literacy, information technology literacy, computer literacy – and is necessary to maximize the information use in libraries in general and academic libraries in particular.

1.1. Information Literacy: Academic Libraries

Majority of academic libraries are having fairly good infrastructure and are technologically in better shape than other educational entities because during the past decade academic librarians have been in the forefront of technological developments and related changes on their campuses. In this new information environment, academic librarians play a major role in the changes taking place in teaching, learning, research by providing effective and appropriate information to the users. Now, they impart the information handling skills, information literacy skills and information technology skills to the information users to create

disintermediation. Information literacy is important for academic libraries. Students need their own navigation systems to manage the information rich environment that now surrounds them. Fresh students have far more experience with the internet and far less experience with print. This often results in a miss-match between academic expectations and student behavior. Academic librarians are competent in-house experts for creating awareness in both students and faculty colleagues how to find, evaluate, use and communicate information effectively.

2. ROLE OF INFORMATION LITERACY IN MAXIMIZING THE INFORMATION USE IN ACADEMIC LIBRARIES

In the information age everyone needs to become competent and confident information user. The rational for designating and information use as a core, generic, transferable skill can be taught in classrooms that do not have books, walls, or computers because information literacy is simply a strategy for knowledge building, communication and problem solving that empowers people to be lifelong learners who can continue to find, use and manage information in productive ways beyond the scope of formal schooling. Both information skills and information technology skills are seen as essential parts of a wider concept of information literacy. CorelDraw distinctions between 'IT Skills' and Information Handling skills'. In this context, IT Skills include Basic skills (use of key board, mouse, printer file disk management) standard software (word processor, spread sheets, databases, etc) network applications (e-mail, internet, web browsers).And further, information handling skills include information sources, evaluation criteria, navigation methods, manipulation techniques, and presentation issues (Bainton).

The collection of new intellectual skills has come to be known as 'information literacy'. According to Bruce, this involves critical thinking, an awareness of personal and professional ethics, information evolution, conceptualizing information needs, organizing information, interacting with information professionals and making effective use on problem solving, decision making and research (Williamson, 2003).

Students must be encouraged to develop the conceptual skills needed to search, sift, retrieve and evaluate information. Information skills development has become one of the chief concerns of the librarians. Information literacy instructions are essential to promote information literacy. User education,

bibliographic instruction, is now gradually being replaced by information literacy instructions – a more broadly and integrated activities in teaching and learning context.

3. THE ACADEMIC LIBRARIAN AS PARTNER IN THE TEACHING AND RESEARCH PROCESS

An academic library is an indispensable resource for its academic community. The traditional practices of academic library staff such as acquisition, processing, and lending library materials and responding to user generated information queries have been replaced by teaching, research and community service. The place for an academic librarian in the future will be outside the library building, actively involved with the academic community. Unmediated information delivery becomes the norm. The need for serves killed navigators to guide, train, and to mediate for users, remains significant. Academic librarians should fulfill this role. They should expand the role of academic library as educator, developer and information navigator (Austen). Developing information skills in students and making them information literate is one of the most essential functions of the academic library staff. The essential information skills are listed as given below:

(i) Student recognizes a need for the information

(ii) Student constructs strategies for locating information

(iii) Student locates and assesses information

(iv) Student evaluates and extracts information

(v) Student organizes and applies information

(vi) Student evaluates the process and product.

4. INFORMATION LITERACY INSTRUCTIONS (ILI)

Information literacy instruction (ILI) requires a shift in focus from teaching specific information resources to a set of critical thinking skills involving the information use. In academic setting information literacy instructions are offered through a variety of instructional sessions, course integrated projects, online information literacy tutorials, stand-alone courses and others implement information literacy into curriculum.

Some of the specific characteristics of successful ILI programs are:

(i) Use of student centered, active collaborative learning methods to make ILI effective.
(ii) Adherence to instructional design principles during planning to minimize problems.
(iii) Relevance to particular course goals
(iv) Relevance to the over all curriculum
(v) Forming partnership between library, faculty, course instructors, students, administrators and departments.
(vi) Large number of students must be covered.
(vii) Continuous and time-to-time effort to reach the goal of ILI.
(viii) The ILI must meet the information literacy needs of the information users.
(ix) ILIs should connect information handling and use to foster learning.
(x) ILIs should impart information skills to the students.

ILI must fulfill the responsibility of helping students / users become information literate both on the campus and across the campus. Ideally, administrators support information literacy goals for their institutions. Course instructors help their students achieve information literacy in their chosen fields, and librarians and other campus professionals collaborate with course instructors in this effort. The librarians need to share in campus – wide collaborative efforts to develop and achieve information literacy goals. Librarians implementing information literacy programmes promote learning and make a specific contribution to the learning process

5. RELATION BETWEEN USER EDUCATION AND INFORMATION LITERACY

User education as various programmes of instruction, education and exploration provided by libraries to users to enable them to make more effective, efficient and independent use of information sources and services to which these libraries provide access.

Some specific components of user education are:

(i) Librarians introducing new students, some of whom come from school systems where there are generally no school librarians or well established libraries, to the complexities of university library facilities.
(ii) Librarians familiarizing users, who have little or no information seeking skills at all with a broad range of library resources in order to develop library skills,

(iii) Librarians educating users on how to find materials manually or electronically using on-line public access catalogues and CD-ROMs (Fidzani).

User Education is a process. Information literacy is an outcome. Excellent user education, coupled with appropriate partnerships and wider initiatives, forms one of the foundations of information literacy. Information literacy is not an issue librarians can address alone: it is an educational and societal issue but it is a concept which librarians have adopted enthusiastically, and which they are working actively to promote within and outside their profession.

Some definitions relate to the skills process or a particular information skills model. Others are about outcomes of information literacy or the attributes and behaviors of the information literate person. Some interpretations place information literacy clearly within education curriculums while others take a much broader view of its implications. People who are unfamiliar with the idea of information literacy may equate it to their particular interest or perspective – such as "IT literacy or library literacy/user education." The move from to user education to information literacy involves a two-fold approach from librarians. Internally, library user education programmes are being refined and developed, while externally librarians are looking to form partnerships that will create broader information literacy outcomes. Understanding of user education philosophy and its purpose is being broadened and promoted, moving from an internal library focus to more collaborative approaches focused on learner needs.

6. THE DUTIES OF USER EDUCATION UNIT

(i) The User Education Unit plans and implements an ambitious education program

(ii) Covering a wide-range of academic disciplines with an emphasis on core competencies and information literacy.

(iii) Works closely with faculty to develop course-integrated instruction based on curricular needs.

(iv) Works closely with Information Technology Services staff on content development for the library's user education web page and Web services for instruction.

(v) Through a variety of initiatives, this may include providing content on a continuous basis for an IL program website, participating in the development and

archiving of IL resources in various media, or considering program assessment methods, this librarian will build an effective and sustainable IL

(vi) Program in collaboration with his/her colleagues.

(vii) Applies principles of assessment to instruction activities.

(viii) Develops user guides and other aids, both print and electronic that are necessary to support the library's education programs.

(ix) Applies best practice procedures and technologies to create the content of user guides and other resources for Web and print publications.

(x) Teaches library instruction and information literacy classes, conducts library tours, and prepares online tutorials as needed.

(xi) Serves as a member of library and university committees.

(xii) Maintains an awareness of emerging trends in IL instruction, facilitates teaching skills development opportunities among librarians, promotes an understanding of IL concepts on campus, and reports on IL activities.

(xiii) Provides leadership in the application of new technologies for information literacy and user orientation.

(xiv) Participates in departmental liaison, reference and collection development based on subject background and experience.

7. DEVELOPING INFORMATION SKILLS

To develop information skills in students the following steps are suggested in literature:

(i) allow time for information gathering and reflection which in turn promotes deep learning

(ii) encourage in-depth focus on a topic driving students to seek more relevant information and produce a product of higher quality

(iii) enable the construction of meaning through active participation with information resources

(iv) promote the acquisition of effective information skills through conceptual awareness of the nature of information and its diversity

(v) promote the development of thinking skills such as problem solving, reasoning, and critical evaluation through information handling and independent research

(vi) allow for information-gathering as a continuous process rather than unconnected tasks thereby encouraging the construction of knowledge at every subsequent phase.

(vii) connect information handling and use with subject matter which is essential for learning to take place

(viii) encourage information skills development though self-directed learning and reflection as opposed to teacher-directed skills instruction which may actually hinder learning

(ix) allow for the active construction of personal understanding using reflection and self assessment so information is given a context, mental model, or framework

(x) discuss search strategy explicitly thereby increasing the likelihood that it will be transferred to future problem-solving situations increase academic achievement through ongoing research experience promote student access to and use of resources by linking cognitive search strategy to course-integrated instruction.

7.1. Associated Skills

The associated skills, technical and IT skills are also to be inculcated in students in addition to information skills:

Flexibility, including adaptation to change, ability to work under pressure, ability to learn quickly, communication skills, negotiating skills, people skills, presentation skills, teaching skills, team working skills, customer service skills, analytical and evaluative skills, subject skills and project management skills.

8. CONCLUSION

The increasing dependence on information in all aspects of life challenges the traditional educational paradigm, particularly the teaching and learning processes. Individuals need to learn more than just the content of a given subject. Academic libraries support the teaching and research needs of institutions they serve. It is the responsibility of the libraries to ensure that the use of its information sources, resources and services are maximized to

benefit its users, hence the necessity for information literacy programmes. Some challenges of IL include motivating students to learn information literacy skills; assessing student mastery of concepts and skills; training librarians to serve as instructors and instructional designers, advocating the value of information literacy in an environment of competing literacies; and preparing students for business settings that demand a more specialized level of information fluency. What matters is the quest for knowledge that matters to the lives of students. Information literacy is the key to conducting student-centered, active learning focused on skill building. Information literacy is a prerequisite for participative citizenship, social inclusion, and the creation of new knowledge, personal empowerment and life long learning.

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ROLE OF LIBRARIES IN DIGITAL ENVIRONMENT: E-LIBRARIES, VIRTUAL LIBRARIES, DIGITAL LIBRARIES

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ABSTRACT

We are in the Information Age. Our society is moving through a 'cyber culture'. Twenty first century has emerged as an exiting period of transition and change. IT has become a potent force in transforming social, economic and political environment globally. At present it is almost beyond one's imagination as to where the developments in IT will lead us to electronic banking, e-mail, information retrieval systems, e-commerce structure and define our lives. These changes, characteristic of global digital era affects our libraries also. In the present scenario of rapidly changing environment, infrastructure and service facilities should be made available according to the need so as to compete and survive in era of globalization and competitiveness. In any organization along with the modification in policies the change in the library system is also of prime importance. The paper is also concerned with the emergence of new concept in the field of library and information science, called 'Digital library'. It provides a glimpse of what is a digital library, its objectives, characteristics, components, barriers, impact of digital library services, and advantages.

DIGITAL LIBRARY AND ONGOING DIGITAL LIBRARY PROJECTS WITH SPECIAL REFERENCE TO INDIA

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ABSTRACT

Today we are living in an information society. The worlds of both communication and the production of information are changing at a fast pace and the convergence of these had huge impact on libraries. This impact is seen in the form of the digital library, the electronic library, the virtual library, etc. Digital library is a global virtual library. It is also called network of electronic libraries. Digital library provides such information services in which all the resources are available in computer process able form and the functions of acquisition, storage, preservation, retrieval, access and display are carried out through the use of digital technologies. A digital library can disseminate its information across a network and users can retrieve the available information. Digital library provide access to digital information collections. Information content in digital library may include a combination of structured /unstructured text /numbers and data, scanned images, graphics audio and video recording etc.

This article describes the definition of digital libraries. Digital library can be as a library having all the information available in digital form. It is distributed virtually all over the world and user access required information on his computer screen. This article deals with different aspect of digital library like characteristics, objectives, advantages, limitations, formats of materials for digitization and ongoing digital library projects in India.

DIGITAL LIBRARIES: CHALLENGES, OPPORTUNITIES AND IMPLICATIONS

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ABSTRACT

The present paper traces the history of electronic resources and explains various concepts of Digital Libraries. It describes various technical aspects of creating and managing digital libraries. This paper explains characteristics of digital library and its requirements. This paper also deals various software used for archiving and preservation issues of digital library along with Indian scenario associated with digital library. Finally, it attempts to visualize the implications of digital revolution on the traditional library system and the need for restructuring the library activities like acquisitions, information services, manpower development and physical infrastructure.

DIGITIZATION: A CRITICAL ASSESSMENT

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ABSTRACT

Any material of informational value, irrespective of its texture, design and format, which is generated in the course of study, research, business or otherwise and kept for reference or preserved for posterity is a record. Now a days the process of information storage and retrieval is undergoing revolutionary changes throughout the world. With the swift pace of development in IT arena, the future libraries and archives are going to be less of paper and more of machine-readable records. The information technology is revolutionizing our concept of record keeping. The impact of the computer technologies on the traditional library roles has been highly profound and has certainly given a facelift to the existing practices.

Digital conversion of library materials has advanced rapidly in the last few years. It promises to continue to expand its reach and improve its capabilities with an astounding speed. Digitization is possible for nearly every format and medium held by librarians and archivists. Archival documents and manuscripts are the most precious, cultural heritage bequeathed to us. It is our prime concern to save them for posterity. For this, we need an impassionate zeal and missionary spirit, sincere and honest efforts. Only then we can usher in a new era in the conservation of documents.

The paper primarily focuses on the potentialities of digitization as a preservation tool. It defines the terms digital information and digitization, gives their characteristics and describes the procedure to digitize. The problems and hurdles encountered while making the technique of digitization a reality and numerous advantages and limitations of digitization are also discussed in this paper. The paper concludes with the observation that, in spite of numerous limitations, digitization appears to be a valuable technique to enhance, expand and extend the information reach to the readers and it is the most wonderful, promising and challenging technology for the librarians and archivists whose mission is to transmit today's intellectual, cultural and historical output for future generations.

DIGITAL LIBRARY: CONCEPTS, ISSUES AND IMPLICATIONS IN BANGLADESH

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Recent developments in information and communication technologies, particularly the World Wide Web (WWW), have given birth of a number of digital libraries. The development of digital libraries is going on with the significant change in the creation, access, use and management of information. This study defines the concepts of digital library as a collection and a storage of information in a digital format and accessible over a network. It explores and outlines the set of major activities and skills to design, develop and manage digital libraries. These skills are of four broad categories viz. Information Communication Technology (ICT), Information skills, Management skills and Research and Project Management skills.

This article indicates the problems for digitization of library as well as information profession in Bangladesh. This study also briefly discusses how to solve the problems. The authors have made some recommendations for the future prospects of digital libraries in Bangladesh.

VIRTUAL LIBRARIES IN CORPORATE SECTORS: A CASE STUDY OF BIRLA COPPER

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ABSTRACT

In corporate sectors people need the information in a very short period and in a most convenient format because of their hectic schedule right from the project stage to the marketing of their products. Hence it is pertinent to know the need of change of information handling and retrieval.

Corporate sectors due to their multidisciplinary function meant to collect and store & utilize the necessary information by way of books periodicals video & audiocassettes, microforms and microfiches etc. As there is a tremendous increase in the amount of information being published and transmitted there is a need of proper collection of data & process the same into the easily available form. Though the traditional form of books & periodicals provide the information required for corporate sectors, it is not possible for them to get the right information at right time and at the right place. Changing method of information storage can best solve this problem and utilization of all the business related information. It is the electronic information sources that help to alleviate the aforesaid lacunae. They can make use of the maximum utilization of electronic devices through modern information technology.

The paper encompasses importance of information in the corporate sectors and the way in which they fulfill it within a shortest possible time. The advent of technology and the impact of the same in an industrial environment especially on library management are explained. The paper calls for a change in library professionals so as to meet the changing information need in the corporate sectors. The meaning, definition, origin and expansion of www virtual libraries and varieties of virtual libraries available on the net are enumerated. The need of virtual library set up in "Birla copper", Dahej in the state of Gujarat, its importance, coverage, and the utilities have been explained in depth.

DIGITAL LIBRARY: SOME ASPECTS IN DIGITAL INFORMATION ERA

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ABSTRACT

At the dawn of the new millennium, we have landed in a global village. We are now at the threshold of breaking into Cyberspace by navigating over Internet and WWW. Every one of us has been allowed by WWW to explore the unlimited global wide digital web of universe of human knowledge. Fast development in the realm of IT offers opportunities for sharing of information resources and disseminating the same to a global audience as never before. Gone are the days when libraries were considered as the storehouse of books. The concept has been changed today. In this hi-tech age of digital information, libraries can no longer afford to remain totally isolated from other fields. Today libraries are becoming more and more sophisticated. With the impact of IT, the concept of Paperless Library, Digital Library, Electronic Library, Virtual Library, etc. have come into the scene

Rapid advancement in information technology has enabled to establish digital library. Such a library has its own specific purposes, objectives, functions, characteristics, advantages, services, etc, which distinguish it from a traditional library. The information resources of a digital library also have specific features. Management support, skilled manpower, equipment, digital acquisition, etc. are important infrastructures required for implementing and managing such a library. Multilingual issues, interoperability, metadata, search and retrieval, intellectual property, economics, etc, are some of the important areas being examined in the functioning of a digital library. A recent trend in research in Library and Information Science is found to be given focus on various issues in digital library management. The present paper describes the need for Digital library, purpose, objectives, functions, characteristics, technologies, advantages, services, information resources, infrastructure requirements, standards and formats, and also protocols.

METADATA: MANAGING KNOWLEDGE RESOURCES IN THE DIGITAL ERA

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ABSTRACT

The paper describes the metadata, which consists of information that characterize data. Metadata are used to provide documentation for data products. In essence, metadata answer who, what, when, where, why and how about every facet of the data that are being documented. The metadata describing electronic resources are essential in the retrieval process. The article is not intended to be a definitive technical summary of metadata. Rather the focus here is on the simple description of metadata with the general overview. The different types of metadata are defined with examples, need and the role of librarians related to metadata is also discussed. It then focuses on the importance of metadata in managing knowledge resources in the digital era.

LIBRARIES OF THE FUTURE

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ABSTRACT

Information explosion is not confined to any particular subject and is taking place in all the fields and in every country. With libraries facing manpower and monetary constraints, it is impossible to acquire every publisher's documents 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 network. The technology for electronic transfer of information is developing rapidly. Further, presently most of the information is reproduced on paper. The 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.

In this paper concept of digital, electronic and virtual libraries have been briefed upon. The motivation for wanting to apply new technologies to library systems arises from three basic sources: first, the need to make existing library resources more easily accessible to users; second, the need to use resources in a way that is more friendly to the environment; and third, the need to make the jobs of library staff members easier, less frustrating, and hence, less stressful. This paper deals with their important characteristics and some of the projects and initiatives taken up in the field. Some light has been thrown on technology and methodology. Various challenges and issues regarding technological obsolescence, pricing, preservation, retrieval and browsing, acceptance, readability, training, technophobia and copyright issue have been addressed.

DSPACE: A SWIFT WAY TO DIGITAL INFORMATION ENVIRONMENT

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ABSTRACT

The digital library offers users the prospect of access to electronic resources at their convenience temporally and spatially. Users do not have to be concerned with the physical library's hours of operation, and users do not have to physicaily go to the library to access resources. At different places in the world, museums, archives, and libraries have started to digitize their valuable stock for preservation and value-adding application purposes. The result of a digitization process is a collection of digital objects and metadata. There are the bibliographical metadata first. In addition, new metadata concerning the digital material itself must be captured and made accessible. There are new technical metadata, which are relevant such as format, size, resolution, access, and copyrights. Additionally, there are metadata representing the structure of a document, which must be taken into account such as the assignment of images to the structure of a music piece (title page, first movement, second movement, etc.).

DSpace is a newly developed digital repository designed to retain and serve the intellectual output in digital format. Paper describes DSpace and related aspects such as how it is different from other digital repositories. Highlights the preserving digital material in DSpace. The Communities found in DSpace are discussed. This paper provides the mechanism to start with DSpace, how DSpace can be established and used. Regarding this the basic technical requirements for DSpace are discussed with examples and provides an overview of Indian universities and institutions, which are using Dspace are discussed and also concludes with the idea that establishing a DSpace continues the library role in modern sense.

MODEL FOR DIGITAL LIBRARY: ISSUES AND PROSPECTIVE

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ABSTRACT

Members of the library and information profession have become acutely aware from the words like "we are working and living in tomorrow's 'virtual world', and we must begin to look to the future and prepare ourselves for what networked technology is making possible". As a consequence, much of the recent literature in the field has been devoted to discussing and exploring the shape of future library and information services. One area receiving significant attention is the development of access to information through digital libraries.

This paper focuses on the existing research in the digital library field and is concerned with the practical application or implementation of digital libraries. There are thousands of digital library projects currently underway, in all sectors of the library community. These projects have taken widely varying approaches, dependent on the needs of the different libraries, the sector in which they are based, and, in part, the definition of digital library that has been applied. This has led to a variety of digital libraries being developed, with no common model being available. This paper deals with key aspect of digital library and prepares a model for the digital library; here discuss components, categories and environment of digital library with issues.

CONTRIBUTION OF KNOWLEDGE MANAGEMENT IN A DIGITAL LIBRARY SYSTEM

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ABSTRACT

Internet has now emerged as a very powerful communication and publishing medium and it has changed the overall ways and means, mode and methods of information dissemination. Like other fields, library and information centers as a disseminators of information too, has made a great impact. The Web, the leading information retrieval service of the Internet (the worldwide computer network) allows users access to a vast array of documents that are connected to each other by means of hypertext or hypermedia links--*i.e.,* hyperlinks, electronic connections that link related pieces of information in order to allow a user easy access to them. Further, the need both static and dynamic metadata fields in a digital library contribute a positive support to Knowledge Management functionalities.

Knowledge Management is a creativity by which skilled Knowledge Management practitioner makes an intelligent use of Information Technology Systems and the pool of knowledge in an organization to exacerbate competency. The clubbing of information about an operating environment becomes knowledge and the deployment of knowledge for some strategic actions bring about increased efficiency or competitiveness that is acknowledged as Knowledge Management. The Knowledge Management has become a global issue and hence, in the present technological scenario, most of the non-profit organizations other than Libraries and Information Centers have emerged to plunge in to Knowledge Management environment for effective dissemination of knowledge. Knowledge acquisitions through diverse collection of information in electronic form including downloading of information on Internet have proved to be a key element of Knowledge Management especially in a Digital Library environment. The paper explains the categories of Knowledge management, knowledge engineering, and knowledge management application arena.

NAGPURIANA : RECREATING HISTORY DIGITALLY
(AN INSIGHT TO THE ONGOING RESEARCH PROJECT ON THE BIBLIOGRAPHIC AREA STUDY ON NAGPUR)

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ABSTRACT

The Telecommunication Technology of the 21st century marks a fundamental change in providing direction to perceive and perform things in a totally different way. Thus, the whole world is surging ahead to reap the benefits of these constantly changing modern technologies. The Library and Information Science professionals have pushed themselves in the forefront to adapt and adopt these technologies to delve into newer areas of Research to offer the best possible services to their beneficiaries. The amalgamation of the Traditional Research methods with the optimum usage of Computer and Communication Technologies are exploring new vistas of knowledge.

A Close Scrutiny of the various Research Manuals in Library and Information Science and a search through the popular search tools on the net clearly indicate, that Historical Research vis-à-vis Bibliographic Area Studies, though extremely popular in the west, have not gained the right impetus in Library and Information Science in India. The present Bibliographic Area Study is one small step in this direction, which has been undertaken as part of a Ph. D. Research project. The Digital recreation 'Nagpuriana' delves into Ten major areas carefully tracing various forms of Bibliographical sources (published and unpublished) related to the above and presents a study based on these (in a standard format) with colourful maps, photographs, charts, tables etc., which could serve as a key source of citation in the future. This article would provide an insight into the said research work.

VIRTUAL LIBRARY: A TECHNOLOGICAL REALITY

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ABSTRACT

Libraries are of different types and exist in many forms. Libraries provide access to information by making available on open shelves and creating a catalogue of their collection, which can be consulted. The physical browsing of library shelves is the most common method of ensuring access to the desired documents. The other method is to first browse the catalogue whether manual or online and then go for shelf browsing. This method is more complex, diverse and concrete. Where as browsing the library shelf is simple, homogeneous, continuous and eye catching. Online catalogue expects the user to formulate some form of query. The dictionary meaning of search is to examine through (place, person etc) for what may be found or to find something of which presence is known or suspected. The definition makes no mention of querying-thinking of terms to describe the objects of search, in this case some items in the library collection. Whereas browsing can be generally defined as wandering around a physical location seeking some items that may be stored there. In a library context browsing may be defined as "planned or unplanned examination of sources, journals, books or other media in the hope of discovering unspecified new but useful information. A browser may have in mind a word or phrase for the subject of the information they seek or they may not. Items in libraries have prominently displayed titles and more generally shelves usually have signs summarizing the subject range of their content. The paper presents the environment of virtual library, technology of virtual reality and its applications.

KNOWLEDGE ORGANIZATION IN DIGITAL ENVIRONMENT IN LIBRARIES

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ABSTRACT

The consecutive development in Information Technology sector has no need to be explained. In this origin Computer has always been the root of its being developed. Revolution in Information media through electronic development has also fanned it. Digitization has Sharpened all these systems & became revolution made need. Digitization has also helped in stepping ahead towards globalization. The character of being converted into binary digital comprising of strings of Zeros & Ones occupies very less space in contrast to other. It is the immune of the present Digital era. Digital environment has changed the concept of traditional library. It has indispensable need of adopting digital technology and providing invaluable preserving techniques, the challenge before Digital environment. It is the advancement in technology, which has given the birth of E-Lib., where majority of the works done through electronic procedures in electronic form like – Cataloging, Circulation, Acquisition, Serial Control, House keeping etc. The advancement of library leads to Virtual library and now to digital libraries. In other words Library has immense prospect of developing it in its service in Digital era.

The technology is one of the foundations of today's library. It has within power to be making the world to be globalized. In the present era, libraries are facing the challenges of high cost of publications, shrinking budget, increasing cost of maintenance of collection, shortage of space and trained man power and on the other side the challenges posed by information explosion and the advancement in various technologies. It is coming like a speeding train or a tidal wave– inevitable and unstoppable. Really, there is a flood of technology which are needed to be adopted at least the sector which are to be an exemplary before its competitor. The world is changing at a phenomenally fast pace and we are clearly in a transitional phase. Changing technology has circled the whole world and brought it in one's finger tips. It has turned the world into village the birth of globalization. Explosion of Information is at an unprecedented rate. It appears to be a fundamental reality of library and information services. The paper emphasizes the virtual library, digital library, and e-books in detail.

DIGITALIZATION AND NETWORKING OF SOCIAL SCIENCE RESEARCH LIBRARIES IN INDIA

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ABSTRACT

The growth of social sciences in India can be attributed to the government's need for social science research in the formulation and implementation of its development plans, the importance of social science research in solving India's innumerable social and economic problems. The demand for information by the social scientists in India has changed dramatically during the past 50 years. There is a need to develop a network of social science research institutes libraries for promoting resources sharing. For this, each library is required to have computers, electronic database and connectivity of data communication networks. A computerized database of bibliographical records of library materials is to be created in each of the participating libraries. A computerized union catalogue is also to be developed to provide a broad perspective about information resources available in various social science institute libraries in the network. Creation of bibliographical records in the network environment requires adoption of uniform standards by all social science institute libraries.

The present study includes social science research libraries in different states of India. The study analyses the digitization of old rare books and manuscripts; Internet and Library Networking facilities in these libraries.

ROLE OF LIBRARIES IN DIGITAL ENVIRONMENT: E- LIBRARIES, VIRTUAL LIBRARIES, AND DIGITAL LIBRARIES

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ABSTRACT

The application of information technology in libraries is dramatically impacting a wide range of library users from special, national, academic, and public libraries. The digital library offers users the prospect of access to electronic resources at their convenience temporally and spatially. Librarians have worked successfully in the last few years to integrate computer technology into the day-to-day library environment. Digital libraries offer such benefits as: equitable access; reduced barriers of distance; timeliness; shared resources; and content delivery. Digital libraries promise an exciting new service paradigm for the 21st century. Digital library contributors will need to collaborate in their efforts to digitize resources if they are to be successful and distinguish themselves from digitization projects that have stood alone inside individual institutions or organizations. An emphasis on technology and information resources, and a very noticeable lack of discussion of the service aspects of the digital library. The library community needs to collaborate to develop a shared vision for a digital library that meets the evolving needs of a 21st century information society. The paper describes the role of digital library in digital environment and concludes towards collaborative development of digital libraries.

ROLE OF TECHNICAL INFORMATION CENTRES OF DRDO IN DIGITAL ENVIRONMENT

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ABSTRACT

The article deals with the role played by technical information centers of Defence Research and Development Organization under the digital environment, the services, and resources available at Centers.

1. INTRODUCTION

Today's technology cannot effectively deal with the reader demands by burgeoning large scale information. In the past, information has been collected, stored, retrieved by using traditional systems. Now the information sources are voluminous and contain such a vast amount of information that new technologies are required to effectively retrieve the information. The challenges presented by the present developments in the information storage and retrieval methods of any Technical Information Centre (TIC). We must understand the following issues of current status.

(i) Why traditional information storage and retrieval techniques are insufficient for retrieval.

(ii) How digital storage/retrieval works

(iii) What are the roles of users and systems are in performing queries and requirements

2. NEED FOR DIGITIZATION

The ultimate goal of digitization is put in place mechanism to enable the laboratory to produce the information it needs in a sufficient quantity, accuracy and timeliness and with minimum cost. This is accomplished by creating conditions where by all levels of the organization come to look upon information not as a free good, but rather as a costly and valued asset that must be

treated with assets, human resources and other represent to achieve its aims.

DRDO will get transformed into a technological leader of world class and would make the nation independent of foreign technology in critical spheres. It is therefore, essential to promote digitization more vigorously in every TIC of DRDO.

Digital information perceived differently by different users. Because of the digital nature of data, we end up with numerous interpretations of the information. To represent all the interpretations of user's needed to explore larger amounts of information to find the desired information. Therefore, we need to provide the user with intuitive ways of understanding the holdings of the TIC. Due to the limited storage capacities of existing storages multiple storage and retrieval methods must be used. Moreover, the information need to be stored at a single place. Therefore, it is important to be aware of information existing at different places.

Using the complete holdings of TIC as a primary information source requires effective ways of retrieving the desired information from a database. To do so, a model that classifies digital data on the basis of ideal characters is required. Then the digital data based on the requirement should be kept for early access. The larger amount of information content present in a digital data makes manual cataloguing, indexing are labor intensive, time consuming and prove to errors.

A number of digital systems have been prepared for the retrieval of information. These are querying based i.e. Author, title, subject, keyword etc. Most of the DRDO tics concerns to have their information facilities for research and development works of defence. It is for this reason digitization process was established at the tics with the sole aim of promoting the R & D work in the country. Subsequently to meet the growing demand for information facility for digital information was established in almost all the tics of DRDO. The tics are recognized as the treasure of information for all aspects of defence related topics.

The aim of tics are maintaining, collecting, and storing the information sources. The various materials maintained in the tics are routinely supplied for the purpose of research work. The tics are established collections on Electronics, Aeronautical Engineering, Aerodynamics, Computers, Electrical Engineering,

Materials, and Mechanics in the center. The collections are generally maintained using various technical procedures, like cataloguing, indexing, abstracting etc.

Consultancy is provided for technical literature as various R & D activities. Advice is also given as various technical literature/documents and on other sources for getting the required information to carry research. In addition, bibliography, slides, indexing and abstracts are provided for fulfilling the information requirements for conducting experiments.

The tics are evolved its own resources and also resources from adjoining TIC database in the facility. These databases are developed using locally available resources. This resources can be browsed through a network called, Defence Research and Development Organisation Rapid Online Network Access (DRONA) or also though a individual networks i.e. RCNET, DNET etc., attempts are currently being made to develop a regional networks based on the data of resources available at all the tics of the DRDO.

The TIC encourages queries regarding various aspects of the laboratory activities from the users and these are attended immediately. Tics also publish bulletins on various topics i.e. Missile flash, Current Contents, Literature Alert, these literature are available in network, browsed by all the research community.

Each laboratory has a well established TIC with larger collections of books, and international periodicals and CD-ROMs of standards, Aerospace databases, Technical reports i.e. NTIS, AGARD, NASA are available in digital formats. Tics are also subscribing number of electronic journals and internet facilities are made available for the scientific community. Computerized database on various engineering topics are available in almost all the DRDO tics for easy to use querying and also for report generation etc. The coverage includes the resources of other local laboratories, and also resources available at DESIDOC. The digital information services have been designed to provide with continuous and detailed updates on the laboratory research activities. The services also provide a monthly review of information services, sources etc.

The environment of digital is a relatively new area of activity; currently the demand for information is higher than our capacities in terms of resources and available information. In response to the

demand tics are entered in to the new technologies. The cost of the services is also little higher. There are efforts to provide more services and more information to the DRDO scientists. The digital information service would cater to the specific needs of in-depth research scientists and their work.

These services emanate regional databases. The service would find wide applications among the services of the DRDO. The TIC databases come with a number of ready to use reports. These are meticulously designed by experts in the field to provide user services. These database runs on PC and regular updates carried. These are available on mostly LAN and databases of DESIDOC available on WAN. Digital information is the backbone of the information systems of the laboratory. The service features a service of documents which keep abreast with the latest and most reliable information and analysis about the defence research. The digital data always features the most recent and authoritative data. The document contains information on all the major sectors of the research areas of the laboratory. The digital information on technical reports reflects competent technical understanding of the defence research and development. Knight rider information (dialog) the online information service provides a wide range of information on defence related topics i.e. Antennas, Radar, Electromagnetic etc., to their clientele. Much work has been done in automating of indexing, and searching of databases.

3. CONCLUSION

With the advent of the information super highway, there is now a larger amount of digital information available across computer networks. As the range of the networks increases, a vast array of digital information is likely to become accessible to the scientists of DRDO.

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COMPUTERIZATION OF KIRORI MAL COLLEGE LIBRARY, DELHI: EXPERIENCES AND PROBLEMS

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ABSTRACT

This paper describes the traditional libraries, development in technology and library computerization. Highlights the pre-requisite, planning and problems arising during the course of library computerization i.e. financial, selection of Hardware and Software and training to existing library staff. Explains actual work of library automation, technological skills required for automated library. Concludes with strategies to develop skills and experience during the course of library automation in Kirori Mal college library.

1. INTRODUCTION

Now a days libraries and librarians/ library professionals facing a great challenge about their survival in the age of Information Technology. Knowledge management is a difficult task as the technology is developing very fast. It is very difficult to manage the library in traditional and manual manner. To automate a big college library is a great challenge for the college librarian. Library automation refers to use of computers to serve the needs of library users. The application of computers in library operations avoids repetitive jobs and saves the lot of time of library staff. Automation being carried out by the college libraries is usually in Acquisition, Serial Control, Cataloguing, Circulation, Physical Verification, OPAC Search and Management Statistics.

2. LIBRARY COMPUTERISATION

Library computerization is gaining importance now a days. Comprehensive studies of library computer system all over world include machine managed acquisition, cataloguing, serial control

and bibliographic service modules. The literature in this area highlights major aspects of computer's role in the library environment. Similar to several aspects of library management, the demand for more and faster information services and decline in library resources are compelling the librarians to appreciate the role of computers within their operations. The librarians are looking to maximize the benefits of automation by spreading computer use to as many aspects of library activities as possible by taking advantage of developments in computer hardware, software and telecommunications, library automation refers to use of computers in library work including library services.

3. KIRORI MAL COLLEGE LIBRARY AUTOMATION

In the context of Kirori Mal College Library the college started the automation work form December 1999. The work is completed in December 2003. At present the college library has 1,15,000 books including bound periodicals, 85 current journals and magazines, 15 daily News Papers. The college has membership of 2500 students of different courses, 140 Teachers and 150 Non-Teaching staff. The college library followed Dewey Decimal Classification and Classified Catalogue Code with some local variations for cataloguing of documents.

A sub-committee comprising of 7 members and Principal as special invitee was constituted for library automation. The sub-committee met on December 22, 1999 and prepared the automation project of Rs.15, 00,000. The Library Committee approved the proposal of sub-committee. The Principal and Governing Body of college also approved the proposal of library automation.

3.1 Finance

The finance is required for the whole project of library automation. From the financial year 2001-02 the library fee was enhanced by Rs.100/- per student per annum for the library computerization Rs.3,00,000/- (Rupees Three Lakhs) was spared form Book Purchase Fund and Rs.3,00,000/- (Rupees Three Lakhs) was received from UGC as one time assistance for library automation. The total amount collected form these sources was Rs. 8,50,000/- (Rupees Eight Lakhs and Fifty Thousand).

3.2 Selection of Hardware And Software

The library automation work as carried out in three phases. In the first phase the following work was carried out.

i) Selection of Hardware

In the meeting of Sub-committee it was decided that branded Hardware will be purchased, retrospective Database creation work of 1,00,000/- documents be allotted to the outside agency and Networking for 20 Nodes. Five Computers with UPS, One Server, One Dot Matrix and One Laser Jet Printer were purchased. Networking work and database creation work allotted to outside agency. About 8 lakhs was allocated for the above items.

ii) Selection of Software

Selection of software for particular application is an important activity. Finding and buying the right software and evaluating the software supplied for library application are crucial. Software programmes have to be considered as tools that help to solve problems rather than as 'solution' to problems. In this concern we compare different types of library software likewise CDS/ISIS, LIBSYS, Techlib +, Oasis, Suchika, TLMS, NETLIBB etc. Comparison of different library software is presented in Table 1.

Table 1- Comparison of different library software

Features	CDS/ISIS	Lybsys	Techlib +	Oasis	Suchika	TLMS	NETTLIB
Multilingual	English, French, Spanish	English	English	English	English	English	English, Hindi, Punjabi, Extendible to other Indian languages
Operating system	Windows	Windows	Unix	NIL	Unix	Windows	Windows
Recurring changes	Yes	Yes	Yes	Yes	No	Yes	NIL
Operational Features	Flexible	Pre-defined	Pre-defined	Pre-defined	Flexible	Pre-defined	Flexible
Import/export	Yes	Yes	Import only	Yes	Yes	Yes	Yes
Price	1500/-	2,40,000/-	1,50,000/-	1,23,000/-	45,000/-	1,00,000/-	40,000/-
Multi-user Support	No	Yes	Yes	Yes	Yes	Yes	Yes
Developer	UNESCO	LIBSYS Corp.	ID (USA)	Australia	DESID	German	Kaptron (India)
Software support	Poor	High cost	Poor	High cost	Poor	High cost	Excellent Economical

In that comparison the library purchased the NETTLIB Software package for the library as decided by the Sub-committee NETTLIB Software can easily accommodate future enhancement to provide additional features. This software is capable to fulfil the needs of college library. The software is intended to facilitate total management of all library functions like Acquisition, Cataloguing, Circulation, Online Public Access Catalogue, Serial Control, Budget Management, Article Indexing and Abstraction, Current Awareness Service, Selective Dissemination Information, Administration, Import Data, Physical Verification and other works.

In the second phase the library purchased three computers, three UPS, 2 bar code scanners, 2 CVT etc. The Bar-coding Job Work was allotted to outside agency but he left the work uncompleted. Then the library staff on Over Time Basis completed the Bar-Coding job work. The expenditure in 2nd phase was about 5 lakhs.

In the 3rd phase the library purchased two Scanners and some other hardware required form time to time. The Bar-Coded Library Tickets were issued to the students', teachers and non-teaching staff. The OPAC started and one circulation counter of Text Books was started in December 2003. Other counter of General Section was started in July 2004. The library is providing the computerized services to users from July 2004. In third phase the expenditure is about 2 lakhs.

4. PROBLEMS AND EXPERIENCES

The college library is facing various problems, which are listed below:

i) The existing library staff is not properly computer literate due to lack of proper training in library automation

ii) Some of members the existing library staff is not taking interest due lack of proper educational and professional qualifications as there is 100% promotion from library attendant to professional assistant

iii) There are some mechanical problems of failure of networking, hanging of computers an failure of electricity

iv) In retrospective conversion there are some errors of editing i.e. name of author, title and call numbers etc.

v) Due to lack of space in the library for independent computer operating as there are four computers with printers and Bar-Code printer are housed in a small room

vi) The users do not return the already issued books to the Teaching and Non-Teaching staff and Bar-Coding of these books have not been done

vii) Some of the staff members (Teaching and Non-Teaching) has not got prepared their Bar-Coded Library Tickets and the library staff on circulation counter is facing problems as ID Numbers are to be checked manually at the time of issuing books to them

viii) There is problem of transliterate of Urdu, Bengali, Hindi books.

There are some experiences of library automation which are listed below:

i) The status of particular book is known within seconds

ii) The repetitive work like preparing of different types catalogue entries, typing of latter etc. has been avoided

iii) Writing of call numbers in catalogue cards and filing of catalogue cards has been avoided

iv) Only One Bar-Coded Library Ticket is issued to the users and One Library Card for one book has also been avoided

v) How many books are issued to a user is displayed on computer screen immediately?

vi) Borrower cannot do cheating in limit of borrowing books as some time the students has original and duplicate library tickets and use both of the library tickets; and

vii) There is facility of print outs of saved documents in automated library.

5. CONCLUSION

In traditional library the repetitive work is very time consuming and the same has been avoided in automated library. The lot of time is saved and the saved time can be utilized for some other activities. The search of documents is very easy and time saving in automated library. The library activities/services are faster and accurate in automated library in comparison to traditional library.

DATA AND INFORMATION SECURITY FOR NETWORKING UNIVERSITY LIBRARIES

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ABSTRACT

The proliferation of the Internet and other computer technologies has been highly beneficial to libraries. Investment in everything from online databases and computing equipment to personnel and training is significant. Libraries need to have policies, protection measures and trained staff in place in order to safeguard their investments in computer and computer-related technologies, personnel and services. This paper will address the topic of information security and information access tools. Further it also envisaged a few suggestions wherever necessary.

1. INTRODUCTION

One of the more recent evolutions in network security has been the movement away from protecting the perimeter of the network to protecting data at the source. The reason behind this change has been that perimeter security no longer works in today's environment. Today, more than just your employees need access to data. Essentially, partners and customers must have access to this data as well meaning that your database cannot simply be hidden behind a firewall.

Of course, as databases become more exposed to Internet, it is imperative that you properly secure them from attacks from the outside world. Securing your databases involves not only establishing a strong policy, but also establishing adequate access controls. In this paper, we will cover various ways databases are attacked, and how to prevent them from being hacked.

2. OVERVIEW OF INFORMATION SECURITY

Information security is not simply computer security. Whereas computer security relates to securing computing systems against unwanted access and use, information security also includes issues such as information management, information privacy and data integrity. For example, information security in a library would include personnel security and policies, steps taken for effective backups, and the physical integrity of computing facilities.

The effective information security in libraries would include:

(i) Staff assigned to information security tasks
(ii) Training all personnel in information security issues and procedures
(iii) Specific policies dealing with information privacy, physical security of equipment, and computer security procedures
(iv) Physical security plans
(v) Data integrity measures
(vi) Levels of access to data or equipment, and monitoring for different types of access

2.1 Important problems

There are two important security problems often not addressed in libraries.

- privacy offered for data that may be collected or collectable apart from circulation records.
- the risk of penetration of library systems from outside parties who may access circulation or other data.

To solve these problems the library may adopt the following techniques:

(i) Maintain a comprehensive list of data that may be collected and the circumstances.
(ii) For each type of data, what risks of misuse exist? Specify a policy for the collection of data and possible misuses.
(iii) Identify personnel responsible for ensuring the policies are followed, and for remediation as needed.

3. THE OPAC

Traditionally, the most sensitive data that libraries collect are circulation records. By necessity, these are linked to identifying information for individual patrons who borrow books or other materials. Online Public Access Catalogs (OPACs) are centralized systems that handle circulation and holdings information, as well as a variety of other data ranging from acquisitions budgets to cataloging modules. OPACs are still with us. Two important changes to OPACs in the final decade of the 1900s have been consolidation in the OPAC industry and the expansion to Web- and Internet-based access models. For consolidation, the number of companies selling OPAC systems suitable for use in all but the smallest libraries has diminished rapidly. Less than a half-dozen companies would be suitable choices for, say, a large academic or public library.

3.1 Likely solutions

(i) Only services needed should be running on the OPAC computer(s). Specifically, all UNIX services (such as email, FTP, rlogin, telnet) that are not required for OPAC functions should be disabled.

(ii) System logs must be kept, and analyzed regularly (daily or weekly) by staff. A logins record should be maintained; integrity checkers such as Tripwire should be used to spot illicit changes to the system software, and the system should be audited regularly for usernames, programs or data that are no longer used.

(iii) Ideally, the OPAC should only communicate with authorized terminals. For example, computers located within library buildings. If outside (Internet) access is required, the ideal scenario is to have a duplicate of the holdings database (or other information, if needed) on a separate server. This way, if the duplicate_server were compromised, the original data and services would be intact.

(iv) Personnel must be specifically responsible for monitoring security updates from the OPAC vendor, as well as the underlying UNIX system vendor.

(v) Historically, OPAC security has relied on (a) obscurity, and (b) OPACs' relative inaccessibility. These factors have changed. The UNIX systems that OPACs are based on have well-known security flaws, and flaws in the OPAC software are more likely to be found when

the OPACs are accessible to the thousands of potential intruders on the Internet.

(vi) Secure wiring and the computer system itself. Assume that any possible illicit use will be attempted.

(vii) To prevent packet sniffing (listening to data sent to other machines on the network), network *switches* should be used in place of network *hubs*. A switch provides a single network channel for each computer, removing the opportunity for sniffing.

(viii) Assume that the software on the computers is subject to change, by either accident or malicious intent. One solution to this problem is to have the computer software refreshed from a LAN server at every reboot. Another is to perform nightly backups to spot inconsistencies and flag problems. A third approach is to rely entirely on remote read-only servers for all software.

(ix) Have personnel regularly attempt to bypass system security.

(x) Decide what level of external access to allow (see below), and what level of logging of access is appropriate. For a medium-sized public library, expenditures for a public-use computer facility with Internet access could exceed tens of thousands of dollars annually, plus personnel costs. Taking steps to insure the equipment is secure is a sound policy.

4. ROLE OF INTERNET

Connecting a library to the Internet means that the Internet can also connect to the library. Procedures for minimizing risk that potential intruders could steal, modify or delete information are well known, and focus on the use of Internet firewalls. A firewall can help insure that many exploits used to gain illicit access to data or systems will fail, such as IP spoofing attacks (where an outside computer masquerades as an inside computer to get elevated access privileges).

Libraries that host their own OPACs (versus those that use a regionally shared one) should consider an additional firewall for the OPAC itself, also perhaps for other particular resources such as cataloging workstations or circulation workstations. This would deliver a two-tiered approach to network security. At the first tier, a firewall system would help protect the library from unauthorized data. At the second tier, a separate firewall configuration would

help protect particularly sensitive systems within the library from unauthorized use. For example, it might be determined that many sorts of Internet data are allowed to go in and out of the library, but only data to particular ports would be allowed to reach the OPAC. The second level firewall would also prevent computers inside the library from sending illicit data to the OPAC.

5. NETWORK SECURITY

The purpose of this policy is to establish a framework for the management and administration of security of the university data network. This policy applies to all existing and future connections to the university data network by students, employees, and academic and administrative departments.

(i) Providing a reliable network and Internet connection to conduct the Institution's business.
(ii) Providing only authorized access to institutional, research or personal data and information on the university network
(iii) Protecting computer system and network integrity at UNC Asheville; and specifically:
(iv) Protecting university computing resources from unauthorized access
(v) Protecting university information from unintended and/or unauthorized disclosure.
(vi) Monitoring the Institution network for devices and users in violation of this policy.

To accomplish these charges

(i) Institution Computing will develop and maintain guidelines for network connections, and for configuration of network-connected devices.
(ii) University Computing has the authority to enforce adherence to its network security guidelines.
(iii) University Computing will proactively scan for security weaknesses in the network or any equipment connected to the network and will provide an audit report to the equipment owner after the scan/audit is completed.
(iv) The Information Security Officer in University Computing is responsible for the interpretation, administration, and enforcement of this policy

6. MINIMUM STANDARDS ARE REQUIRED FOR DEVICES CONNECTED TO THE CAMPUS NETWORK

6. 1 Software patch updates

Campus networked devices must run software for which security patches are made available in a timely fashion. They also must have all currently available security patches installed. Exceptions may be made for patches that compromise the usability of critical applications.

6.2 Anti-virus software

Anti-virus software for any particular type of device currently listed on the must be running and up-to-date on every level of device, including clients, file servers, mail servers, and other types of campus networked devices.

6.3 Host-based firewall software

Host-based firewall software for any particular type of device must be running and configured according to the "Implementing Guidelines for the Minimum Standards for Security Campus Network on every level of device, including clients, file servers, mail servers, and other types of campus networked devices. While the use of departmental firewalls is encouraged, they do not necessarily obviate the need for host-based firewalls.

6.4 Passwords

Campus electronic communications systems or services must identify users and authorize access by means of passwords or other secure authentication processes. All default passwords for access to network-accessible devices must be modified. Passwords used by system administrators for their personal access to a service or device must not be the same as those used for privileged access to any service or device.

6.5 No unauthenticated email relays

Campus devices must not provide an active SMTP service that allows unauthorized third parties to relay email messages, i.e., to process an e-mail message where neither the sender nor the recipient is a local user.

6.6 No unauthenticated proxy services

Although properly configured unauthenticated proxy servers may be used for valid purposes, such services commonly exist only as a result of inappropriate device configuration. Unauthenticated proxy servers may enable an attacker to execute malicious programs on the server in the context of an anonymous user account. Therefore, unless an unauthenticated proxy server has been reviewed by SNS and approved by the CISC as to configuration and appropriate use, it is not allowed on the campus network.

6.7 Physical security

Unauthorized physical access to an unattended device can result in harmful or fraudulent modification of data, fraudulent email use, or any number of other potentially dangerous situations.

6.8 Unnecessary services

If a service is not necessary for the intended purpose or operation of the device, that service shall not be running.

7. TOOLS FOR INFORMATION SECURITY

Survey of Nmap users from the nmap-hackers mailing list determined a few important security tools. A few are:

7.1 Ethereal

Sniffing the glue that holds the Internet together, Ethereal is a free network protocol analyzer for UNIX and Windows. It allows you to examine data from a live network or from a capture file on disk. You can interactively browse the capture data, viewing summary and detail information for each packet. Ethereal has several powerful features, including a rich display filter language and the ability to view the reconstructed stream of a TCP session. A text-based version called tethereal is included.

7.2 Snort

A free intrusion detection system (IDS) for tSnort is a lightweight network intrusion detection system, capable of performing real-time traffic analysis and packet logging on IP networks. It can perform protocol analysis, content searching/matching and can be

used to detect a variety of attacks and probes, such as buffer overflows, stealth port scans, CGI attacks, SMB probes, OS fingerprinting attempts, and much more. Snort uses a flexible rule based language to describe traffic that it should collect or pass, and a modular detection engine. Many people also suggested that the Analysis Console for Intrusion Databases (ACID) be used with Snorthe masses

7.3 Netcat

The network swiss army knife. A simple UNIX utility which reads and writes data across network connections, using TCP or UDP protocol. It is designed to be a reliable "back-end" tool that can be used directly or easily driven by other programs and scripts. At the same time, it is a feature-rich network debugging and exploration tool, since it can create almost any kind of connection you would need and has several interesting built-in capabilities.

7.4 TCPDump / WinDump

The classic sniffer for network monitoring and data acquisition. Tcpdump is a well-known and well-loved text-based network packet analyzer ("sniffer"). It can be used to print out the headers of packets on a network interface that matches a given expression. You can use this tool to track down network problems or to monitor network activities. There is a separate Windows port named WinDump. TCPDump is also the source of the Libpcap/WinPcap packet capture library, which is used by Nmap among many other utilities. Note that many users prefer the newer Ethereal sniffer.

7.5 Hping 2

A network probing utility like ping on steroids hping2 assembles and sends custom ICMP/UDP/TCP packets and displays any replies. It was inspired by the ping command, but offers far more control over the probes sent. It also has a handy traceroute mode and supports IP fragmentation. This tool is particularly useful when trying to traceroute/ping/probe hosts behind a firewall those blocks attempts using the standard utilities.

7.6 DSniff

A suite of powerful network auditing and penetration-testing tools. This popular and well-engineered suite by Dug Song includes many tools. dsniff, filesnarf, mailsnarf, msgsnarf, urlsnarf, and webspy passively monitor a network for interesting data

(passwords, e-mail, files, etc.). arpspoof, dnsspoof, and macof facilitate the interception of network traffic normally unavailable to an attacker (e.g, due to layer-2 switching) sshmitm and webmitm implement active monkey-in-the-middle attacks against redirected SSH and HTTPS sessions by exploiting weak bindings in ad-hoc PKI.

7.7 GFI LANguard

A commercial network security scanner for Windows LANguard scans networks and reports information such as service pack level of each machine, missing security patches, open shares, open ports, services/applications active on the computer, key registry entries, weak passwords, users and groups, and more. Scan results are outputted to an HTML report, which can be customized. Apparently a limited free version.

7.8 Ettercap

In case you still thought switched LANs provide much extra security n is available for non-commercial/trial use.

7. 9 Whisker/Libwhisker

Rain.Forest.Puppy's CGI vulnerability scanner and library

7.10 John the Ripper

An extraordinarily powerful, flexible, and *fast* multi-platform password hash cracker

7.11 OpenSSH / SSH

A secure way to access remote computers

7.12 ISS Internet Scanner

Application-level vulnerability assessment

7.13 Tripwire

The grand-daddy of file integrity checkers

7.14 Sam Spade

Freeware Windows network query tool

7.15 Nikto

A more comprehensive web scanner

8. CONCLUSION

Information security includes personnel security, privacy, policy and computer security. Specific personnel must be assigned security-related tasks in order for any security system to be effective. Due to the continuing emergence of new security exploits, tools and techniques – coupled with the constant parade of software and hardware upgrades likely in most library environments – ongoing diligence is required to keep informed of security developments.

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E-BOOKS: IT'S ACCESSIBILITY, PROBLEMS AND PROSPECTS IN THE CONTEXT TO SCIENCE AND TECHNOLOGY LIBRARIES IN INDIA

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ABSTRACT

The production and usage of e-books is growing at a fast pace and warrants serious consideration, especially in libraries and information centres of Indian universities, institutions of Higher Education, S & T Organizations and other institutions of national importance like IITs, NITs, IIMs, and IISc. They are actively engaged in building electronic information resources for providing value added services to users to meet their information needs. The paper discussed with various challenges facing by S & T Librarians and potentiality and future of e-books. It also discussed the role of e-book providers like Net Library, QUESTIA, Versaware, Abode E-Book store, CyberRead, E-Book Studio and many more. In addition to that the paper discusses the role of free e-book providers like Gutenberg Project, University of Verginia E-Book Library, University of Pennsylvania E-Books, National Academy Press etc. It also discussed the advantage and limitations of e-books in different environment like bandwidth, connectivity etc. Lastly, it suggests that there is need to formulate a workable and sustainable strategy in S & T Libraries. It also urgently needed that systematic efforts are taken to develop suitable information infrastructure for providing access to e-books. It can be concluded that there is need to formulate a workable and sustainable strategy in S & T Libraries. It also urgently needed that systematic efforts are taken to develop suitable information infrastructure for providing access to e-books.

1. INTRODUCTION

With rapid growth and development in the use of modern information and communication technology and the internet, a huge potential exists in the ways the information is published and made available to the individual at home, institution or libraries and information centres. The production and usage of e-books is growing at a fast pace and warrants serious consideration, especially in libraries and information centres. Libraries and information resource centres of Indian universities, institutions of Higher Education, S & T Organizations and other institutions of national importance like IITs, NITs, IIMs, and IISc are actively engaged in building electronic information resources for providing value added services to users to meet their information needs. Presently S & T Librarians facing various challenges like users information behaviour, database creation and its security formulation of collection building strategy etc. To meet these challenges E-Book is a boon to the S & T Librarians.

"An electronic book is the electronic content that is transmitted and or displayed on a device or system to be read by the viewer similar in experience to reading a physical book. An e-book is written in machine-readable form (Computer Screen) down loaded to a PC of digital assistant or place on a reader design for that purpose. It may be referred to a document of written record or electronic text. It can be delivered by down loading or as e-mail file attachment.

2. WHY E-BOOKS

It is observed that e-books have great potential and bright future to attract users. In addition to this fact, there are some other major factors which also motivate S&T institutions to consider developing e-books are listed below:

- Can be updated and, stored very easily
- Can be downloaded instantly
- Contain the latest and most updated information
- Users can read an e-book any time
- Due to portability, e-Books can be taken any where on portable computer
- Business and recreational travelers can load e-books on their portable computers without adding weight or taking up space in their luggage
- Font size can be changed suitably.

- Provide facility to hold and turn pages easily
- Physically disabled users can hear audible e-book
- In buying e-books, the overhead charges like shipping, postal, handling are totally ruled out
- No cost of technical processing and maintenance
- Link can be created in the record of OPAC
- No risk of book theft and tearing and mutilation of pages
- E-books have background music and animations.
- Hyper linking enables users to communicate directly with authors
- E-books save library space
- E-books do not require bindery and repair
- E-books save human resources for shelving and rectification
- Users can not misplace e-books

3. E-BOOK RESOURCES AND ACCESSIBILITY

Electronic books are accessible via the Web in a number of forms. Generally, they are texts that have been scanned or typed and either published on a Web server or made available on the Web for downloading. These can be free access or access on payment.

3.1 Free Access

E-Book resources are referred to be a free when access to the sources is not dependent on a subscription or membership in an organization or a publisher. Some of the freely accessible E-book resources are stated URLs below:

- Project Gutenberg (http://www.promo.net/pg)
- Bartleby.com (http://www.bartleby.com)
- University of Virginia e-book Library (http://etext.lib.virginia.edu/ebooks/ebooklist.html)
- University of Illinois Electronic books (http://www.press.uillinois.edu/epub/books.html)
- University of Pennsylvania Online Books (http://onlinebooks.library.upenn.edu/)
- The National Academies Press (http://www.nap.edu/)
- Web Book Publication (http://www.web-Books.com)
- Digital book Index (http://www.digitalbookindex.com)

3.2 Access on Payment

Due to rapid growth and development in the use of modern information and communication technology and the Internet, publishers are now started to shift their publications from print media to online electronic media. Instead of onetime selling printed books they are giving access to books in their server on rental basis like e-journals. Some publishers are selling e-books one time at the real cost of books and again they are charging annual access fees like subscription of e-journals. Some prominent e-book publishers and e-book sellers on Engineering and Technology and other subjects areas are described URLs below.

- netLibrary (http://www.netlibrary.com/Gateway.aspx)
- Kluwer Online (http://www.kluweronline.com/ebooks/sales/) (Recently merged with Springer)
- Safari Tech Books Online: (http://proquest.safaribooksonline.com/)
- John Wiley (http://www.wiley.com)

3.3 Other E-Books Providers

In addition to netLibrary, Kluwer online etc. dealing with engineering and technology subjects there are numbers of e-books providers in different variety of subjects like fiction, history, entertainment, college books. Some of the e-book providers dealing with such subjects are stated URLs below:

- Questia (http://www.questia.com)
- E-Book Palace (http://www.ebookpalace.com/)
- BarnesandNoble.com (http://www.barnesandnoble.com/)
- Booklocker.com (http://www.booklocker.com)
- Book-Studio/Studio E (http://www.studio-e-books.com)
- Word Wrangler (http://www.wordwrangler.com
- Palm Digital Media (http://www.peanutpress.com)
- Powells.com (http://www.powells.com)
- CyberRead (http://www.cyberread.com)

4. LIMITATIONS OF E-BOOK

Though the e-book has great potential and bright future to attract the users it also have some limitations.

(i) Physical and Mental Strain: to read an e-book is not comfortable in comparison with printed book. It cannot be read in leisure time lying on bed or sofa. It can't be read in open air. Continuous reading of an e-book sitting in front of computer system affects the eyes and nerves.

(ii) Reading an e-book while traveling in train or bus is not so easy and cheaper in comparison with printed books. Laptop or Palm top with battery system is urgently necessary to read an e-book, which is more costly than a book.

(iii) In addition to cost, the user has to ca..y the machine which is difficult and a matter of risk like break / damage or theft.

(iv) Students, faculties and research scholars those are staying in campus may avail the computer facility during working hours but if any student stays out side campus has to purchase computer and Internet connectivity for reading online e-books. Common students cannot afford such financial burden. Only in campus students, faculties and research scholars of IIT's, IISc., and NIT's / REC's can avail this facilities. In India there are plenty of private Technical & Engineering Collages who can't afford even in campus facilities.

(v) E-book is costlier than printed book. The expenditure of an e-book is sum total cost of e-book plus access charges plus internet connectivity and usage charges which is costlier than that of a printed book.

(vi) In addition to Indian Scenario the survey of Task Force of the University of California 2001 found that most institutions are still in trial stage with e-books and e-book market viable are not quite in pace.

5. PERSPECTIVE AND FUTURE OF E-BOOK

The e-books are having so many disadvantages and problems but still e-book has its perspective due to the following features:

(i) Malleability
(ii) Flexibility
(iii) Search ability
(iv) Ubiquity

Though there are several problems of e-books in Indian environment the institute like IISc, Bangalore, NIT, Calicut, NIT, Surat is going for e-book through netLibrary, Kluwer online and Safari Tech. Books online. Other NIT's are also coming forward to procure e-books in near future.

6. SUGGESTIONS AND RECOMMENDATIONS

It is noted that e-books are very useful source for academic and research pursuits, teaching and serving the students and faculties effectively and efficiently. The librarians can provide satisfactory services using e-books. In case of NITs and other engineering and technological institutions following points are suggested which will help to develop e-book collections in S&T Libraries and Information Resources Centers.

(i) While selection of e-book the usability may be considered

(ii) Encyclopedia and handbook type books may be given first preference as these types of costly books may be preserved safely in provider's server and there is no problem of theft and any mutilation.

(iii) Text book may be avoided as these books will be used by the students and faculties outside the campus according to their own time.

(iv) In case of NIT and self-finance engineering and technical institutions band width may be increased up to 100 MBPS for fast access.

(v) Strong negotiations are to be enriched regarding access charges through the consortium.

(vi) Stability and longevity of access of e-books should be ensured from the providers in case of any provider decide to close down their business.

7. CONCLUSION

The role of e-books in academic, science and technology library there is a considerable development of standard technologies and pricing models needed to make the market for e-books viable and

sustainable. Vendor's support for open process of scholarship and long term preservation may be preferred. It can be concluded that there is need to formulate a workable and sustainable strategy in S&T institutions for e-books development, procurement and circulation policies. There is great future for e-books in S&T libraries. It is also urgently needed that systematic efforts should be taken to develop suitable information infrastructure for providing access to e-books.

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IMPACT OF COMPUTER APPLICATION AND INTERNET FACILITY ON LIBRARY AND INFORMATION SERVICES IN ANCA LIBRARY: A STUDY

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ABSTRACT

There is a remarkable impact on the library and information services like reference, bibliographical, indexing and abstracting, SDI, CAS, OPAC, Inter Library Loan, Agricultural extension and referral services. The users are getting better and wide access to resources within the library. The quality of the services has been improved; the users are accessing unlimited information on agriculture through Internet for their research. Students are searching more widely the literature for their study and use of library has been increased per student. The paper describes the impact of library software and Internet on library and information services in Anand Niketan College of Agriculture Library, Anandwan. Taking into the consideration the paper presents the need of the Agricultural Library users.

1. INTRODUCTION

Anand Niketan College of Agriculture Library is functioning from 1965 in a separate library building at Anandwan Campus at Warora, Dist. Chandrapur, a backward and tribal region of Eastern Maharashtra. The library is managed by Anand Niketan College of Agriculture of "Maharogi Sewa Samiti" Anandwan established by renowned social reformer Dr. Baba Amte. The development of agricultural education, research and extension and improvement of production, essentially require timely supply of information to agricultural students, academic staff and scientists of college. The

library is concerned with academic needs of students, teachers, and in a broader and deeper sense with the aims and objectives of the college. The library working has been computerized with the help of Library Software and Internet connectivity for the better development of Agricultural Education, Research and Extension Education and this has a positive and qualitative impact on the library activities and information services to users.

1.1 Resources and services of Library

The resources and the facility of Internet and services are presented in Table-1 and 2.

Table-1 Resources of Library

Sr No.	Resources of Library					
	Infrastructure			Collection Development	Financial Resources	Human Resources
	Building		Equipments			
	Status	Carpet Area				
1		2	3	4	5	6
1	Separate	5000 Sq ft.	Computers 4 Printers 2 Scanner 1 Software I (SOUL) Reprography equipment 1 Internet facility	Books 15000 Ref. Books 250 Annual Reports 25 Scientific Periodicals 30 Journals (Gratis) 15 News Papers 14	Rs. 3.00 Lakhs	Librarian 1 Library Assistant 1 Library Clerk 1 Library Attendant 1 Library Peon 1 Swachak 1

Table-2 Services of Library

Sr. No.	Library Services		Library Users	
	Manual Services	Computerized Services		
1.	Reference service	Reference services	Students	400
2	Documentation Service	Internet services	Academic Staff	35
3	Current Awareness Service	E-mail service	Scientist	06
4	Selective Dissemination of Information service	On Line Public Access Catalogue CAS Service	Others	30
5	Press Clipping Service	SDI service		
6	Inter library loan service	Inter-library loan service		
7	Referral service			
8	Advisory service			
9	Reprography service			

2. IMPACT OF APPLICATION OF LIBRARY SOFTWARE AND INTERNET FACILITY

2.1 Library Software

The library has been computerized with the application of SOUL Software. There are acquisition, cataloguing, circulation, serials, OP AC and administrative, modules of SOUL Software which cover all the library activities. Application of this software has a great impact of all the library functions. It can process information much faster way than the human being can and permits better work flow through the library. This computer based information system saves time of library staff and efforts involved in producing the information products. From user point of view, the system saves the searching time and information can be made available by various combinations of desired key terms with the least possible time.

The Table-3 indicates the impact on library functioning.

Table-3 Impact on Library Functioning

Sr. No	Library Functioning	Before Application of Computerization	After Application of Computerization	Saving of time	Impact
1	Acquisition	100% time	50% time	50%	Improvement in library functioning
2.	Cataloguing	100% time	20% time	80%	Saves time

3	Circulation	100% time	20% time	80%	Saves searching time
4	Serial Control	100% time	40% time	60%	Process information much faster way Easy and quick access possible Help in various transaction
Total Average		100% time	32.50%	67.50%	

2.2 Internet Facility

Internet has become the most powerful ANCA library tool for providing library and information services to the users. Internet has profound impact on various library and information functions and services, such as collection development, acquisition, technical processing, circulation, OP AC, document delivery service, reference service, CAS, SDI, inter-library loan service, library professionals, users of library and other related services of library. Internet is helping in various activities of library and enhanced its effectiveness and efficiency. The Internet has made possible the whole process of generation and manipulation of information at a cheaper ratio. Most of the libraries of scientific, research and educational institutions are now connected through Internet. The impact is increasing the number of daily users of library given in Table-4.

Table-4 Impact in increasing the number of daily visits of users

Sr. No.	Users of Library	Total number of users	Visits of users before application of computerization		Visits of users after application of computerization		Impact Increased the number of users
			(Daily users)		(Daily users)		(Daily users)
			No. of users	Percentage	No. of users	Percentage	Percentage
1	Academic staff	35	15	42.85%	25	71.43%	28.58%
2	Scientist	06	03	50.00%	06	100%	50.00%
3	Students	400	100	25.00%	150	38.00%	13.00%
4	Other users	30	05	16.67%	08	22.85%	06.18%
	Total Average	471	123	33.63%	189	58.14%	24.51%

2.2.1 Acquisition

Major publishers and bookshops have set up their websites on the Internet. These websites give detailed information about their publications, which may include book review, abstract, annotation, price etc. Large numbers of selection tools like books in print, booksellers' catalogue are now available on the Internet. The librarian is selecting right and latest books for library with the help of these sources. The orders are placed directly for books and periodicals subscriptions online using e-mail. Subscription agencies also provide instant information regarding subscription of journals, receipts, payments, reminder for missing issues etc. to the libraries. The library is using e-mail for orders and correspondence purposes and due to this the expenses on STD and Postage are avoided. The Internet has made the whole acquisition process much faster cheaper and easier for library.

2.2.2 Cataloguing

The catalogue for new books is prepared on the day of acquisition itself and it is thus not necessary for library staff to classify and catalogue books locally which saves a lot of time, money and efforts of staff. Internet is also providing access to publisher's catalogues and OPACs of large libraries. As OPAC are the sources of bibliography and cataloguing information through Internet.

2.2.3 Classification

The library has using the Dewey decimal classification system for its collection.

2.2.4 Reference Services

Traditionally library was providing reference and referral services using the collection available in the library. Now, a large number of reference sources are available on Internet. These sources enable library to provide prompt and efficient reference services to the users. Online sources are ensuring current fax and faster delivery of information products and services to the users. The students and academic staff find out the information on agriculture, crops, plants, seeds, pesticides, medicinal plants, agriculture engineering, organic farming, news letters, sports and games and according to the syllabus through various web sites. The information helps to them to improve their efficiency. The library is

providing CAS and SDI services to the specific user groups using Internet resources. For this purpose, library has maintained a user profile about their specific subject interest. Library regularly scans relevant databases, websites, and latest journals and retrieves relevant information suited to the interests of the users and communicates through e-mail.

2.2.5 Inter Library Loan Services

The library is making use of e-mail to provide effective inter-library loan and document delivery services to the users. Internet is the most powerful medium for access, communication, publishing and delivery of information. Internet offers tremendous opportunities and challenges for all kinds of libraries in achieving their goals. The increase in the use of information services by the users is given in the Table-5.

Table-5 Increase in the use of information services by the users

Sr. No.	Computerized information services	Total no. of users	Use of information services after application of computerization		Use of information services before Application of computerization(Daily users)		Impact of using information services by the users
			(Daily users)		Manual services		(Daily users)
			No. of users	Percentage	No. of users	Percentage	Percentage
1	Reference services	471	23	11.33%	50 users Reference	7.14%	7.14%
2	Internet services		70	34.48%	Documentation		
3	E-mail service		5	2.46%	CAS/SDI		
4	OPAC		100	49.26%	Press Clipping Inter library loan service		
5	CAS Service		01	0.49".4			
6	Sm service		02	0.98%	Referral & Advisory service		
7	Inter-library loan service		02 (M)	0.98%			
					Reprography service (MSS)		
	Total Average	471	203	14.28%	50	7.14%	7.14%

2.2.6 Impact on ANCA Library functioning, services and users

The impact on ANCA library functioning, services and users reveals that the functioning at 67.50, Services 7.14 and Users 24.51

3. CONCLUSION

The Anand Niketan College of Agriculture Library is marching ahead with application of modem technology for dissemination of information to its students, teachers and scientist in a much better way. There is a considerable increase in the number of students and teachers who visit the library. There is qualitative and effective change in the services rendered by the library staff to its users. There is also remarkable change in the efficiency of library staff members and they are showing greater interest in providing library services. The users are searching information on their own and as such there is a great time saving.

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IMPACT OF INFORMATION TECHNOLOGY ON MARKETING OF INFORMATION SERVICES

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ABSTRACT

The introduction and application of IT techniques have elevated the modern day library to a very high pedestal and improving and altering its image, functions and service to revolutionary extent great efficiency and effectiveness IT had virtually immense potential for a variety of applications in libraries. IT helps libraries databases of their collections and making them for easy access to users inside as well as outside through networks. It enables libraries to provide most efficient and specialized information services. The paper describes the marketing and librarianship and areas of marketing of library services and concludes with impact of information technology on marketing of library services.

1. MARKETING AND LIBRARIANSHIP

With the emergence of Information and Communication technology, the concept of marketing has gained importance in library and information centers throughout the world. Self-support policies. increasing competitiveness in the marketplace, rising customer expectations, and widening access to information are some of the main reasons for this trend. To survive in such an environment, Library and information centers must identify their users' needs and integrate this information into the everyday workings of the library and market it by making best use of the technological gadgets.

Information technology (IT) is a combination of computer and telecommunication technologies, which whence applied to different spheres of working brings about a new innovative work atmosphere to accomplish job of information storage, processing, retrieval, dissemination and transferring speedily, pin pointedly, accurately and comprehensively, it is all about the application of varieties of electronics to the information handling activities that are central to the operation of almost any organization in these days. The term IT is of recent origin and is a comprehensive term. The term encompasses the notation of information handling activities.

In brief, it can be started that IT is a general term used to denote all activities connected with computer based processing, storage and transfer of information .It is a computers besides electronic media, satellite, telecommunication and information. It is a tool through which information is transferred, recorded, and edited, stored, manipulated and disseminated. It is a science of information handling, particularly using computers, to support the communication of knowledge in technical, economic and social fields.

Philosophy is an inquiry into truth. The philosophy of librarianship encompasses the fundamental principles on which the practices, techniques, and activities of libraries and information centers are based. These principles serve as guidelines for successful librarianship and as a means for resolving problems. The integration of marketing into library services is helpful because it reinforces and reiterates the basic values and beliefs of the profession in a changing environment.

The most widely held belief about library services is that the primary aim is to provide the right information to the right user at the right time. Achieving this goal means reducing barriers to access, enhancing the use of information, and empowering users to access information on their own, particularly through the use of modern technologies.

In library and information services, marketing can help us clarify the following aspects of our work:

- A focus on the users' goals and on helping users articulate these at every level.

- A focus on providing an environment in which users can study and work.

- The belief that each user has unique needs, requirements, and expectations when her or she visits the library.

- A commitment to helping the user develop skills to acquire information from various sources. (Gupta and Jambhekar, 2002)

2. CONCEPT OF MARKETING

The marketing is the process of planning and executing the conception, pricing, promotion and distribution of goods, services and ideas to create exchanges with target groups that satisfy customers and organization objectives. It simply means, working with the market to actualize potential exchanges for the purchase of satisfying human needs and wants." The marketing is a type of management process, which identifies, anticipates and supplies customer requirements effectively and profitably. Thus marketing includes for basic components namely, identification, anticipation, satisfaction and profitability.

Marketing is a technique that involves planning, staffing, organizing, decision-making and decentralizing the whole process of work. The main elements of marketing are:

(i) Understanding the users needs and aspirations
(ii) Analyzing the users and libraries strengths and weaknesses.
(iii) Exploring the means of technology for dissemination of information
(iv) Understanding the trends of marketing and
(v) Drawing an action plan for marketing of information services to the users.

2.1 Areas of Marketing of Library Services

The present society has recognized information as product or resource like other resources " information is saleable, and there is a constant market for it". The concept of marketing of library services, rather of information marketing, is still in a state of infancy particularly in academic libraries.

The different types of library services that can be put on marketing may be as follows:

(i) Compilations of bibliographic services
(ii) Current awareness services
(iii) Selective dissemination of information services
(iv) Indexing services
(v) Abstracting search services
(vi) Literature search service
(vii) Reprographic service
(viii) Translation service including various online services

2.2 Impact of Information Technology on Marketing of Library Services.

The introduction and application of IT techniques have elevated the modern day Library to a very high pedestal and improving and altering its image, functions and service to revolutionary extent great efficiency and effectiveness IT had virtually immense potential for a variety of applications in libraries. IT helps libraries databases of their collections and making them for easy access to users inside as well as outside through networks. It enables libraries to provide most efficient and specialized information services. It has been established that efficient information support and effective communication in an organization are closely associated with high performance, productivity and innovation. Most of the operations with in library are interrelated, interdependent and mutually supportive for the overall mission of the library. The use of IT applications to interface and integrate each function with the other saves a lot of time of the staff as the same data used not be reentered at every stage. The IT can be employed in four ways in the library.

(i) to automate the library (in –house services)
(ii) to automate the information storage and retrieval.
(iii) to automate the library office and
(iv) for resource sharing and networking.

The automation helps libraries to improve their operation and accelerating their Working, IT has speeded up the accessioning procedure, processing work b y elimination of a large amount of repetitive work. MARC is easy to manipulate as can be searched online from which there are available various types of outputs. Online bibliographic databases have significant effect on collection development. By using the IT devices like computers, fax e- mail

etc, the Library and Information Centres can easily search the online Public Access Catalogues (OPACs) of their libraries for a particular document and can share the resources for different purpose. In Inter Library Loan Services (ILLs) we can send the request for ILL to the other libraries and get the documents in short of time. This all can be done in LAN or WAN networking environment. IT has also influenced reference services like many other services of the library and information centres. The new IT has reduced the response time for reference query. Besides the major reference sources are readily available in optical discs as well as on on-line databases.

The bibliographies of various collections can be compiled and launched on-line on to the computer networking or can be sold in market on CDs on in hard copy. This all is possible through the uses of latest information technology and can be provided on charges basis.

The literature search can be carried out in particular library for its own collection as well as of the other libraries on networking. IT facilitates The Library and information centres providing literature search service by searching various information sources in print or non print media with in a library or outside the library or at national or international level in a short time with accuracy. Today, there are so many libraries, which have there own websites, their web sites can be searched for their collection. There are various search engines for your help like yahoo, AltaVista etc, if you do not know what is to be searched or how the particular site of a library could be found out? By giving the keywords they tell you the address of particular sites, where your desired document is available. Then you can directly jump over that sites can down load the material.

Like prenatal cataloguing, readymade catalogues of many documents are available on line, which can be downloaded from their respective sites for further use by the other libraries. These can be marketed and made available on price like e-business made on the Internet. The bibliographical services like OPAC 97 (http:/www.opac97.bl.uk/). Amazon.com Books (http:/www.amazon.com) etc. are examples, which have been offering their services to be marketed.

3. CONCLUSION

Information Technology is showing its impact on the time, accuracy, efficiency and effectiveness of he various libraries and information centres services, other wise that will be out of the competition in the era of information technology. The foundation for a great marketing plan is to examine the library mission, values, and philosophy of service. Then analyze library capabilities and research customer needs to find out what works or what needs improvement. Use the analysis and research to establish goals, select strategies for promotion, develop the marketing plan of action, implement, and evaluate how well you meet your goals. Use results of evaluation to make changes or to develop a new marketing plan that responds to changes in the library, in the community, and in the world of information.

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LIBRARY PORTAL: EFFECTIVE INFORMATION COMMUNICATION

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ABSTRACT

In the contemporary networked ambience, one can perceive the paradigm shift from physical management of information assets. libraries of books to electronic management of information assets, i.e., e-resources, including World Wide Web. Conceivably, these new media forms have been replacing the printed text. This transition from printed text on paper to microform to screen in digital form is significant to LIS professionals, as thrust is upon distributed delivery of resources and services. Libraries can refurbish their services through building portals for providing timely, distributed and instantaneous access to internal as well as external resources through apposite links. A library portal can be a virtual addition to the existing physical structure, reaching out to the patrons and streamlining the access modes, which make e-communication and web interface much more effective for the user. This paper emphasizes the need for an integrated library portal that provides mechanisms for communication and collaboration through intuitive interface.

1. INTRODUCTION

Communication is a fundamental social process, a basic human need and the foundation of social organization. Human activity is entirely dependent on communication and human race could not have progressed without communication. Communication is central to the Information Society, which offers a social and technological milieu for populace to create access, utilize and

share information and knowledge, which in turn enable the communities to achieve their full potential for sustainable development. The rapid progress of these technologies opened new vistas and offered new opportunities to multitude of users, irrespective of the barriers posed by time and distance. We, the information professionals should recognize that education, knowledge, information and communication are at the core of human progress, endeavor and well-being and take the challenges posed by Information and Communication Technologies (ICTs) as an opportunity for effective and flawless communication of information. In the contemporary networked ambience, one can perceive the paradigm shift from physical management of information assets, such as libraries of books to electronic management of information assets, i.e., electronic resources, including World Wide Web. This transition necessitated libraries to build a library portal that acts as a vehicle and offers a web interface to users for enhanced accessibility to and usability of a wide variety of e-resources available globally.

2. SIGNIFICANCE OF LIBRARY PORTAL

We witnessed a tremendous change in means and modes pursued by the academic world for imparting education in tandem with technological advancement. Libraries as the integral part of academia began to make a determined move towards the provision of electronic access to information for their clientele, since the changes put forth the development and implementation of new media forms, perhaps even the replacement of printed text. Replacing printed text means a transition from one state to another and a change in the materiality of the object that communicates the text to readers. This transition from printed text on paper to microform to screen in digital form is of great importance to LIS professionals, since it is inevitable to adopt these new forms as our information resources and also redesign our services accordingly. The extensive use of computers and networks and the global reach of the World Wide Web have made creating, publishing, distributing, using, and reusing information many times easier and faster than the past decade. In addition, new educational and instructional models and methods made imperative for libraries to redesign and reevaluate the way they design, develop and manage their information systems for distributed delivery of resources and services. Moreover, users are accustomed to using the Internet for quick and easy access to information wherever and whenever they need it. And also interactivity as the primary characteristic of new technologies

caused a considerable reassessment of communication modalities of libraries. To offer the patrons the interactive services, libraries need to refurbish their services through building portals for providing timely and instantaneous access to institutional as well as external resources through apposite links. The library portal can be considered as an e-resource, which includes an online catalogue of materials as well as gateways to digital/electronic resources accessible to user. In order to enrich learning and research by providing timely and convenient access to appropriate resources and fruitful use of collections in the web environment, a library portal should be a *portfolio* of resources, potentially customized to individual interests.

3. PORTAL v/s WEBSITE

Before going into other sections of this paper, we need to distinguish between a portal and a website, since these terms often confuse us. Even though portals and websites share many similarities, the following distinct features of a portal distinguish it from a website.

(i) A portal allows for both content and application (at the interface or user interface level) aggregation into a single, consistent interface with a minimum of coding and with greater flexibility; and

(ii) A portal allows end users to configure the layout and content of the portal on an individual basis.

In succinct, a portal is an integrated and personalized web-based interface to information, applications and collaborative services.

A library portal is "a single access point combining the library catalogues, subscription databases (bibliographic and reference), subject gateways, electronic journals etc." A library portal meets the individual needs of users, which either the system itself can tailor the delivery and presentation of information content or the users themselves can customize the type and format of information displayed. Customization of services encourages experimentation, thereby, increasing utilization of resources. However, customization may foster measurable innovation and experimentation in academia and R &D, but in other areas, this might not be feasible.

4. EFFECTIVE COMMUNICATION

Communication has been intensified the human force with information and knowledge, through different stages of development. At first, this development was driven by changes within the human species, later by technological progress. This transition can be described in six stages, viz., (i) the age of signs and signals, (ii) the age of speech and language (iii) the age of writing (iv) the age of print (v) the age of mass communication, and (vi) the age of Information Society. Mass communication was originally modeled as one-way transmission of message, from source to receiver. Interaction, on the other hand, demands a two-way (or multi-directional) model of communication. With the interactive features of new media, the receiver is recognized as an active participant. Since users seek information more than they receive, the role and scope of libraries and information centres has been widened. Libraries not merely link the generators or creators with the users of information but also institutions, communities, countries and continents with the aid of global networks, that is to say, they can tap the resources of other libraries located elsewhere in the world with little effort, in contrast to earlier cumbersome processes.

Effective communication is not a one-way monologue aimed at the receiver. Rather, it is a two-way dialogue that engages both the sender and receiver, in sharing. Unless there is someone who hears and responds, there is no communication, even though the sender or the communicator sends a message. Effective communication can be defined as, 'Passing relevant information, in a style and form that is clearly understandable, to the right person at the right time, with feedback facility.' Libraries need to serve the said purpose by building integrated portals that offer a collaborative and communication space. The two-way communication through portal may occur via e-mail, shared calendars, web meetings, online discussions through message boards and chat rooms. These tools allow individuals to log on and discuss new developments, thus, keeping abreast in their field of interest. E-mail addresses can make communication easy between users and information workers and discussion forums and live chat areas attract and keep readers at library's site. If we look into the current scenario of library portals, we find only basic feedback tools, such as e-mails for queries and answers, regarding library resources and services. Even though, we find bulletin boards, they are merely confined to communicate the changes made to online library itself. A library portal can be a

virtual addition to the existing physical structure, reaching out to the patrons and streamlining the access modes, which make e-communication and web interfaces much more effective for the user. To describe the significance of electronic communication:

"The electronic mode makes it possible to deliver information wherever the reader may be (for instance, to his or her computer in the home or workplace, or by wireless technology to any place), to present information that cannot be captured in print (such as video attachments, tables that can be manipulated and so on), and to facilitate use of information through quality interfaces and search capabilities" (National research Council, 2000).

5 LIBRARY PORTAL DESIGN CONSIDERATIONS

In this section we delve into the key attributes that determine the robustness of a library portal. One may take the following critical components into consideration as follows:

5.1 Ease-of Use

The foremost feature to be considered is the ease-of-use, which can be determined by the effectively organized home page. The ease with which the users find information depends upon the multiple paths provided to find information, at the same time, keeping the number of clicks to a minimum in finding pertinent information. The user should perceive ease-of-use with the accessibility and usability of library portal, so as to interact with the system quite often. Technology Acceptance Model (TAM) devised by Davis and his colleagues, defines **perceived ease-of-use** as "the extent to a person believes a system will be free of effort and is proposed to influence both adoption and perceived usefulness, since the easier it is for a user to interact with a system, the more likely the user would find it useful and intend to use it." Furthermore, text should be kept terse and lucid, so that user can scan and locate the needed information quickly and sometimes, obscured information they seek.

5.2 Search and Navigation

In addition to consistent and logical *navigation framework*, effective *search functionality* and *site maps* are mandatory in the homepage. Direct access to the commonly used services needs to be supported by the library portal, as the users expect to have the

capability to complete tasks online. Search boxes are preferable to search buttons and need to be placed in a prominent location.

5.3 Cross-linking

Users may like to have more than one path to find the same information. Take for instance, they may look one of the several paths, viz. OPACs, request (borrowing/circulation) forms and library services for *inter library loan* or *document delivery service.* Cross-linking ensures that the users would find the information they are looking for.

5.4 Geographical Differences

Geographical differences in *language*, *terminology*, *identity* and *content* are to be taken into consideration in designing process.

(i) Predominantly, we use English language for the portal, however, as the technology improves to handle cross-language issues in terms of translations and information access, greater accommodations to a variety of languages will be valuable to the users.

(ii) In addition to language differences, terminology also differs with geographical limits. Therefore, utmost care should be taken even in using terminology, as it is critical to pacify a diverse set of users, accessing the portal.

(iii) Though a library portal as public domain serves multitude of users located across the globe, each library should retain some local identity to accommodate the needs of its primary users, i.e. local community.

(iv) Information needs and information seeking behaviour of users may vary with the region and depend on the nature of their work. Consequently, content of the portal should support the unique information needs, then only personalized services can be rendered. Portal personalization can occur at multiple levels i.e., each individual user or group of users or the organizational level.

5.5 Personalization

As we discussed earlier, a portal should be personalized at multiple levels. Each individual user or a community and/or group

of users can have settings for each of the portal functions that they use. A portal provides a framework for users to store the settings and tailor the content that they are interested in seeing. Though the terms personalization and customization are used interchangeably, one can find distinction between the two. Personalization refers to 'the extent to which a library portal meets the individual needs of users', whilst, customization refers to 'the capability of portals to allow users to specify their own preferences for the user interface "look-and-feel" attributes'. Customization typically accommodates preferences for colour schemes, modules that appear and the layout of the modules and content on a page of the portal. A portal can be personalized using user-profile to deliver personalized content. Each user can gain a view that is tailored to his or her access privileges. User has to sign on with a username and PIN (Personal Identification number) on entry to the library portal to access personal profile information and tailor the design based on customization feature. Or else, a portal may give users the ability to create their personalized pages by selecting what they want to see whenever they get access to the library portal. This personal page may keep track of resources for a user, his library account, queries kept until the session ends, request and reserves and also renewals. Currently, though many portals do not support personalization to a large extent, it ought to be incorporated to design an integrated, interactive library portal.

5.6 Contact Information

Contact information should be prominently displayed on the home page, so as to easily locate the library staff and also to post queries/comments regarding library resources, services and facilities. It can be designated as an *electronic reference service* and appropriate topics under this service to be included:

(i) Checking citations or references
(ii) Quick facts and figures
(iii) Search strategies
(iv) Problems with e-resources
(v) Catalogue and web corrections
(vi) Queries about library policies
(vii) Compliments and complaints etc.

5.7 Way to Home Page

A portal should clearly offer a way to return to the home page, such as listing "home" as the first or last option in the navigation

framework. Users find this feature useful as the home page contains useful content and pertinent links to external resources.

5.8 Information Literacy

Above all, users must be *information literates*, since they should get acquainted with the electronic communication of information. Information literate can access information efficiently and effectively; evaluate information critically and competently; use information accurately and creatively; pursue information related to personal interest; strive for excellence in information seeking and knowledge generation. This feature is vital, which assists the users not only in searching and evaluating but also in using the information retrieval tools and interactive information systems. Eventually, information literacy through a library portal serves all intents and purposes of a library.

6. CONCLUSION

Libraries and information centres are primarily communication channels that perform the task of transmitting information available in varied forms and formats to pacify the divergent needs of users. In order to cope with technological advances and users', ongoing demand for delivery of information at their desktops, libraries need to design integrated portals for effective communication of content. Library portal should provide a collaborative space for interactive tools, such as discussion rooms, bulletin boards, e-mail etc., and facilitating knowledge sharing online. This collaborative and communication space should enhance accessibility and usability; support personalization of the interface; and foster knowledge work through shared information workspace comprising of content. However, in order to assist the users in the fair use of tools and services offered, library portals should facilitate web-based information literacy programs. This paper aimed at identifying critical issues to be considered for design and creation of an integrated library portal. Nonetheless, thorough investigation is necessary to determine definite and explicit design considerations.

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LIBRARY RESOURCES AND SERVICES IN THE DIGITAL ENVIRONMENT: A STUDY OF SELECT ACADEMIC LIBRARIES IN TAMILNADU

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ABSTRACT

Digital Libraries with the combination of computers, telecommunication, CD- Rom, online, networking Data Base technologies are playing a key role in disseminating information by providing different types of relevant and recent information to the clients. This paper aims to focus on various information resources and services provided by some libraries in Tamil Nadu in the digital environment. This paper starts with the general theme with respect to library resources in digital farm and the services provided to the academicians with appropriate statistical tools.

The study undertaken with the help of the structured questionnaires collected from various academic librarians in Tamil Nadu, is dealing with the network facilities available, the services provided in the digital environment, the access provision and the skill of the library professionals in disseminating the existing service.

1. INTRODUCTION

Digital Libraries are now a days expected to provide the resources and access to Global information by integrating National and International Information Centers by eliminating the barriers of distance, time, people with increasing application of internet,

intranet and extranet facility. With the combination of computers, telecommunications, CD-ROM, networking, Online data base, etc., Digital Libraries are playing a key role in disseminating information by providing different types of relevant and recent information to the users with in a short span of time.

According to Mathur (2001), "it is the time that an introspection of the present sanguine academic culture is made compatible with the needs and aspirations of Indian people in this vibrant age of information superhighway. The Indian Educational System thus faces an unprecedented challenges of designing it's vision for the 21st cy. The cyber age is a forced dispersion of the Indian Educational System, which already accepted in the Vision of 2020 as conceptualized by Dr. APJ. Abdul Kalam, The Hr. Education is bound to shift from the culture of print to the culture of Digital Technology and hence, the libraries are changing their complexion".

Keeping in view of the above comment, the present study aims to focus on the digital collections available, its usage in terms of service provided by the library taken for sample and the manpower structure and their skill in managing the digital Library environment.

1.1 Objectives of the study

(i) to identify the collection development

(ii) to analyze the bibliographic data base

(iii) to rank the services provided in the sample libraries taken

(iv) to measure the technical skill of the library professionals

1.2 Hypotheses of the study

(i) Higher the provision of the budget, better will be the collection

(ii) More of the collection infrastructure in the digital environment, better will be the service

(iii) Adequate staff provision with proper training leads better usage of the collection and proper service to users

1.3 Methodology

Among the libraries available in Tamil Nadu a sample of about 60 libraries have been taken for this study from various districts. A structured questionnaire has been prepared to collect the primary data based on collection development, bibliographic subscription, services provided, manpower development etc. The libraries have been categorized according to the geographical region. The Chennai, Coimbatore and Madurai based libraries have been put in Level I and the Level II libraries are selected from the cities Vellore, salem, etc., the III level libraries are taken from the cities Dharmapuri, Cuddalore and Chidambaram.

2. DATA ANALYSIS

2.1 Components of the Digital Library

The major components of a Digital library are hardware, software and the users along with the Library professionals, which have been diagrammatically represented in the following diagram 1.

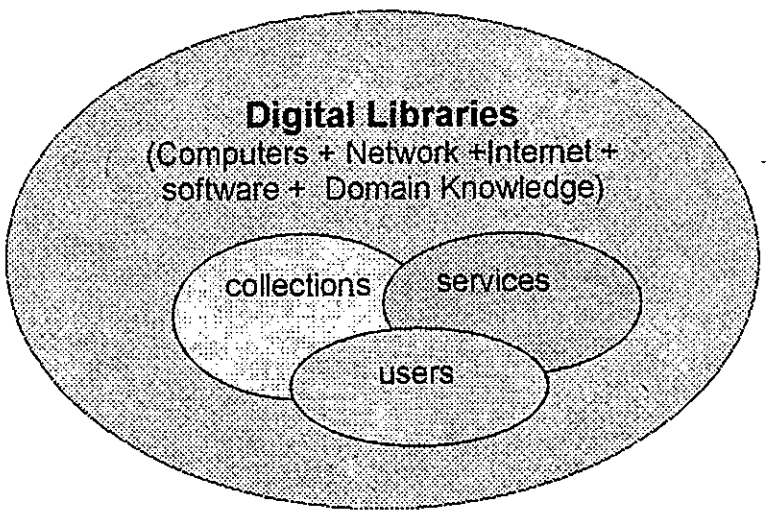


Diagram 1: Major Components of the Digital Library

The hardware, software and the Internet facility in the sample taken have been identified. Most of the Level – I libraries are completely automated and nearly 40% of the work are conducted in the digital environment. Though it is spoken to undertake the

survey of digital library, possible collections and services have been considered for the study. The procedures like e-books, e-journals and e- publishing etc., are being engaged well in the First level libraries and little bit lesser in the II and III level libraries.

2.2 Analysis of Digital Collections

Libraries tried to develop the digital collections to meet the qualitative educational requirements of the academicians apart from the existing physical collections. The Internet as a major resource center helps the libraries to provide information beyond the imagination and expectation of the users. The digital library is expected to be centered on good collection journals, magazines, books and other materials obtained through collaboration with a wide range of national and international networking agencies or from commercial publishers. The prime intention is to attract a variety of users to the library by providing different range of required information.

According to Kaur (2004), the digital collections are classified into two main categories, i. Possesses digital collection, which includes Cassettes, Floppies, CD, DVD, etc., and ii. Accesses/ accessible collections are such as online resources like e books, Bibliographic data base, e journals, etc., He also added," the collection should be in terms of materials in it and the value of each time in relation to items not in the collection, to the community being served, and to the library's potential users".

With the sample taken in to consideration the table below reveals various collection proportions among the libraries. When considering the CDROM collection, the libraries in level – I cities have 48.86%, the libraries in level II cities have 29.96% and the III Level city libraries have 21.18%. Table 1 presents the collection development among the three level libraries.

Table-1 E- Collection Development among the Three Level Libraries

S. No.	E- Collection	Level- I (%)	Level- II (%)	Level III (%)	Total (%)
1	CD ROM	48.86	29.96	21.18	100.00
2	E- Journals	58.54	31.29	10.16	100.00
3	Audio Cassettes	45.85	33.60	20.53	100.00
4	Video Cassettes	43.87	38.53	17.59	100.00

The above table also reveals that in subscription of E-journal collections also the Level – I category libraries stood first by having 58.54% followed by 31.29% of level –II city based libraries and the III level city libraries possess only 10.16% of e- Journals.. The reason for this variation again is found to be is due to the lack of allotment in the annual journal subscription amount. Only the level I cities are having much infrastructure and the librarians are directly consulted with the problems and prospects of the library development policy by the authorities. These libraries are having consortium either with the publisher or with some professional bodies. In the Level II and III city based libraries, the fund allocation is much less, and in some libraries they are struggling with the development of hard copy collection itself. The lesser hardware and software infrastructure, the high cost in going for consortium even for some basic needs are some of the reasons for the less collection in these two levels of libraries. The audiocassettes and the videocassettes vary in proportion according to the levels of the city as displayed in the above table.

2.3 Analysis of Bibliographic Subscription

In any academic library the bibliographic collections play a vital role since most of the databases are published in electronic form. While coming to the subscription of bibliographic database, the collection is good at level I city libraries. The Engineering Colleges are subscribing the COMPENDEX, INSPEC, METADAX, etc., The medical libraries are procuring much data bases on Drugs and the MEDLINE data base, DIALOGUE on Disc etc., are the most commonly found data bases in 50% of the libraries. The level I city based libraries have 61% of the bibliographic subscription and the libraries falling in level II have 28% of the bibliographic subscription and the level III libraries have only 11% of the Bibliographic subscription. The reason for the variation in the subscription of the databases is that the level I cities are enriched with much fund allocation. The other infrastructure like LAN and other computer network facilities are also found to be good in this level – I city libraries. Whereas the Level II city libraries are moderately having the hardware and software infrastructure facilities due to lack of fund allocation. Some of the III level city libraries are in infant stage and some university libraries coming under this group is having better infrastructure. In some of the self-financing colleges the computer facility has not yet been initiated.

2.4 Digital Services Provided By the Select Libraries

In considering the flow of information and knowledge, the goals of developing a digital library are not different from the purposes of having a traditional library.

(i) both provide information to users by collecting items;

(ii) both serve as disciplinary and general human-communication systems by collecting and organizing the items of knowledge;

(iii) both depend for their existence on the users' needs and uses for the communication, construction, and production of knowledge that take place in a social or other community setting (Chen, 1976).

In spite of the above argument, why we have to go for the electronic services is that, the electronic collections can be used by many people at a time and users need not waste their time by going through the traditional catalogue for the physical existence of the material.

In this study, the services like Current Awareness Service (CAS), Online Public Access Catalogue (OPAC), Inter Library Loan (ILL) CD-ROM , e-journals, e-books, Internet, Email, and all other digital services have been taken into account and ranked according the preference of usage of the same in all levels of the libraries. In the I level libraries, the Internet, OPAC, CDROM database and the online journals stood in rank I, the ILL, and CAS stood in rank II and the DTP & the translation services in III rank. The audio, videocassette services in rank IV and catalogue card, and printing are in rank V.

Where as in the II level city-based libraries, there is a fluctuation in using the Internet, CDROM, ILL and OPAC though they are in high level of usage. The remaining services are falling in rank II and III. Among the III level city based libraries some libraries give I preference to the OPAC and Internet followed by the ILL, CAS etc. Some of the libraries falling in these categories are still using the card catalogue as the second preference. The reason is that some libraries are fully automated and some are in initial stage.

2.5 Service through Institutional Membership to National and International Networking

The librarians of the sample libraries have been asked for the Institutional membership in National and International Level. The

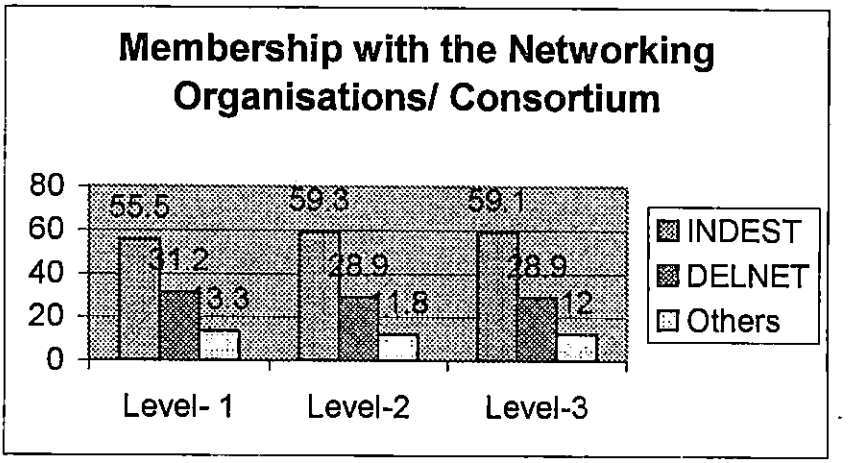
libraries falling in the level-I, II and III are mostly having the membership with the INDEST, DELNET, J- Gate, MALIBNET, JET, ERNET, NICNET, etc., along with some other professional bodies. The proportion of the libraries of various levels of the libraries has been exhibited in the following Table-2.

Table- 2 Membership with the Networking Organisations/ Consortium

Organisations	Level-I libraries(%)	Level-II libraries(%)	Level-III libraries(%)
INDEST	55.5	59.3	59.1
DELNET	31.2	28.9	28.9
*Others	13.3	11.8	12.0

*Others : J- Gate, JET, INFLIBNET, ERNET, NICNET

When considering the membership of the national and International networking, the libraries are having enough exposure to any one of the consortiums or being member of the other networks. Some libraries are having only JET and J GATE since the subscription amount is low and the sources are up to the expectation of the users. The percentage proportion of the service provided by various levels of the libraries have been shown in the bar Dig. 2.



Dig. 2 Membership with the networking organizations/consortium

2.6 Manpower skill in Digital Library Management

The usage of Computer, in various functions like CDROM operations, Email sending, Internet Browsing, Multimedia handling, document delivery, etc., have been analyzed by asking the respondents by having their acquaintance with the system in terms of the years of experience in using the computers. Here the respondents are asked to fill the columns as mentioned in the frequency of 1-3 years, 4-6 years and more than 7 years. The respondents who are not having the computers or who don't know to work in the computer are put in the others column in the Table - 3.

Table- 3 Experience in Handling the Computers in Libraries

(in Percentage)

S. No.	Device Name	1-3 years			4-6 years			> 7 years			Others		
		L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
1	CD ROM	10.3	20.1	45.1	25.2	32.6	21.4	62.1	37.2	14.9	2.4	10.1	18.6
2	Email	16.2	18.0	16.5	23.7	29.1	30.2	60.1	53.0	50.9	0.0	0.0	2.5
3	Browsing	13.9	17.3	37.3	21.8	24.3	28.3	57.6	52.9	22.1	4.7	6.5	12.3
4	Multimedia	42.3	21.9	35.2	12.9	28.1	18.9	15.7	20.3	12.4	29.1	20.7	33.5

The above table reveals that the librarians in level I libraries are having expcsure to the computer with more than 7 years of experience in all the devices mentioned in the table. The Email and browsing have been popularized only after 2000 in level II and Level III libraries. The figures in the table explicit itself that

The collection development of the digital library depends upon the integrity of the librarian, the management and adequate financial support. The manpower development play a key role since the Information Retrieval and dissemination of information from the library collection to its users depend on them. So the library professionals have to be persuaded to undergo enough training in all the above platform to prove themselves to be fit in to the digital library environment for extracting the resources.

3. CONCLUSION

Digital Collections are expected by the users increasingly due to its unique characteristics such as, its reliability, vast storage, better comparison, content page service, E mail alert, regular free subscription of the newsletters, online clarification, meeting the experts at home in one touch of the computer, day to day

upgraded information, subject oriented indexes, ie., Meta data provision, etc.

This study concludes by providing following views to bring the library services more effectively and efficiently.

(i) Librarian's views should be suggested while framing the library policy in building up the library collection and in budget allotment.
(ii) There should be no intermediate between the management /principal and the librarian.
(iii) The library professionals should be trained enough to manage with the digital library environment.
(iv) The subscription rate for the National & International networking facilities should be minimized.
(v) The National and International Networking organizations should maximize the member institute's request by providing information within the short span of time.
(vi) The user must be provided with proper guidelines, library tours or orientation program.
(vii) The Internet facility should be provided to libraries at infant stage itself.

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THE CHANGE IN THE UNIVERSITY LIBRARY: TOWARDS THE TWENTY-FIRST CENTURY

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ABSTRACT

The objectives of the University libraries have been to acquire only essential books and relevant serials; to develop excellence in our finding tools for identifying and locating information resources; to use these tools to identify all other resources and to provide access as required using document delivery services and to purchase electronic information services when they can provide a cost and/or coverage advantage compared to print resources. This strategy has been supported through developments in electronic publishing, the Internet and information technology and their anticipated capacity to empower the University community to access information via personal computers linked to networks and to enable the Library to play an intermediary role in addition to the traditional warehouse role.

Through the application of modern technologies, and particularly the growth of the Internet and more recently, the development of the World Wide Web, libraries are forming an international network to advance research and scholarship at the University.

The Changing Information Environment and the changing expectations and demands of library users are forcing libraries to reassess their role in the digital age. How is the change to digital information sources affecting the scholarly work of college and university students? How can the libraries be more users centred? How can the quality of current services be improved? What services not currently offered should we provide to better serve our users?

Academic libraries must provide services for students and faculty at the distant sites. Library services for distant learners include electronic delivery systems, compressed video transmission, contracting with local libraries, and sophisticated document delivery. Librarians in all parts of the world are re-inventing their roles and reorganising the libraries in which they work, as a result of information technology. This paper looks the role of librarian in facilitating learning to learn, user's expectations of library services, information product issues and proposed courses of action in 21st century.

TOOLS AND TECHNIQUES FOR INFORMATION HANDLING

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ABSTRACT

A well planned infrastructure for knowledge organization is required. This includes the resources, processes and policies for analyzing user's needs; locating knowledge organization system to answer these needs; and acquiring, implementing and maintaining the knowledge organization system. The development of the hardware, software and network architecture to support its integration and maintenance is important.

The present paper discusses the generation of knowledge, types of knowledge, tools and techniques for knowledge organization in digital environment and also role of librarians in the digital environment.

SEARCH ENGINES AS RESOURCE DISCOVERY TOOL FOR SCHOLARLY COMMUNITY IN IITS

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ABSTRACT

Search engines are the web sites that collect the data from the Internet so that sites, information and content can be found more easily. This paper looks the search engine as a tool enables to locate information on the World Wide Web. Search Engines use keywords entered by users to find Web sites, which contain the information sought. Types and Elements of Search engines also discussed. Differentiates between Search engines and directories. The paper covers ten Search engines tips, how they work. Some tips of using Search Engines. Lastly narrates the importance search engines in IITs for catering the needs of scientist and scholars. Concludes with suggestions for better Search from the horizon of huge information.

DIGITAL ENVIRONMENT

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ABSTRACT

The advancement of Information Technology gave birth to one of the greatest discoveries of the century i.e. digital libraries, e-libraries, virtual libraries etc. Digital Environment in libraries responds an advanced infrastructure and a strong capacity for development. Easy access to information improves decision-making at all levels, aids effective public policy, accountability and governs, reduces overhead expenditure and save time needed to shift resources to high productivity and more opportunities. It also develops new concept on 'Call Centers'. I would like to call it as 'Service Libraries', to create more employment opportunities to exchange information & services needed from time to time for the people. The paper describes the digital library environment and its waves in libraries and education and proposes the new search engine and concludes with trend move toward producing hyper sensitive digital super babies.

REFERENCE AND INFORMATION SERVICES IN DIGITAL ERA

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ABSTRACT

Today the Internet has taken the responsibility of controlling the problems like collections, organization, storing, retrieval and dissemination of information. The Internet and WWW have brought significant improvement in the provision of reference and information services. Many internet-based reference and information services are now available, provided not only by libraries, but also individuals and different agencies. This means that users need not go to specific library to obtain a reference service, and the services is not restricted by the collection of given library. User can go to a particular site and can search for information.

This article discusses the changing trends in reference and information services. Reference and information services are considered as the *summon bonum* of all the library activities. But due to changing technologies and the application of Internet or WWW in library, the nature of reference and information services have changed. Now various reference and information services are available trough Internet or WWW, provided not only by libraries but also by individuals and companies. Now users need not to go to specific library to obtain a reference service but just go to a particular site and can search information on their own or can ask a question that is answered by a librarian.

INFORMATION RETRIEVAL SYSTEMS IN THE ACADEMIC LIBRARIES: RECENT TRENDS

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ABSTRACT

Three dramatic and fundamental changes have occurred due to the advances in modern computer technology and the boom of the web. First, it became a lot cheaper to have access to various sources of information. This allows researching a wider audience than ever possible before. Second, the advances in all kinds of digital communication provided greater access to networks. This implies that the information source is available even if distantly located and that the access can be done quickly. Third, the freedom to post whatever information someone judges useful has greatly contributed to the popularity of the web. For the first time in history, many people have free access to a large publishing media. Fundamentally, low cost, grater access, and publishing freedom have allowed people to use the web as a highly interactive media. Such interactivity allows people to exchange messages, photos, documents, software, videos, and to chat in a convenient. More recently, the advent of modern computers has made possible the construction of large indexes automatically. Automatic indexes provide a view of the retrieval problem, which is much more related to the system itself than to the user need. The paper traces on information retrieval systems in academic libraries and describes various information retrieval systems of academic libraries and concludes with recent trends.

THE E-CONSORTIUM FOR MANIPUR STATE: A ROADMAP

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ABSTRACT

To wider access to the e-resources for various fields and research areas, cooperative approach of resource sharing seems to be essential. At present three e-systems are found on work in the State of Manipur. The State Government also is likely to introduce soon the "State Wide Area Network" under its IT policy 2003. It is proposed in the present work that all the e-systems of the State should work together sharing each other's resources forming a consortium. It is expected that the said gaps will be minimized because of the formation of this consortium. To make the proposal distinctive, two 'roadmaps' are designed for consideration of all concerned agencies of the consortium. The paper proposes the 'roadmaps' for Manipur state with special emphasis to INFLIBNET and its problems.

1. INTRODUCTION

The Manipur University Library is one of such selected INFLIBNET centers that bears a great responsibility to fulfill the objectives of the INFLIBNET. In the State, besides INFLIBNET, the other three important e-systems engaged with transferring information/ data are the National Informatics Center (NIC), Community Information Centers (CICs) and the proposed "State Wide Area Network" of Govt. of Manipur (GOM). The basic concepts on which these three e-systems stand are the "Electronic-Governance (e-G)" and the "Government to Citizen (G2C) Interface" for reaching people at any location of the State. These two concepts are used as guidelines for reinforcing the traditional management-process of any e-system so that it can (i) produce better output, and (ii) disseminate/ transmit the same to

its target groups of any location efficiently and effectively. In this backdrop, two 'roadmaps' are humbly designed. The first one is concerned with the application of the "e-G" concept to the INFLIBNET-management and the second roadmap deals with application of the "G2C Interface" concept linking INFLIBNET with other three important e-systems after forming 'consortium'. The objective of these new designs are to make the INFLIBNET-system" a part of the State government's new IT programme (2003). So that it can use the e-infrastructure of the Government to serve the people of the State in better way.

2. THE CONCEPTS/TECHNIQUES

2.1 e-Governance

The "e-G" may simply be defined for our purpose as providing efficient, effective and good governance (i.e. administration with control-capacities) to all the components i.e., operating, storing and using components through the proper use of Information Technology (IT) for achieving the objective of the system. The e-G thus is nothing bu. "application of information, communication and electronic technology to the process of government functioning" to bring about simple, accountable, responsive and transparent administration so that the purpose of the function can be achieved. The technique, as mentioned in IT policy of Government of Manipur, 2003 is used "to upgrade the standard and quality of administration and to provide citizen users oriented, efficient and cost effective government". Two main contributions of the e-G, as presumed, may be: I) improvement of the administrative-process; II) establishment of an efficient and effective communication system between the electronic-services and the end-users. The objective of the e-G may be realized from (i) better internal efficiency; (ii) better law/ruie enforcement; (iii) appropriate dissemination and retrieval of information; (iv) transparency in work; (v) reduction of cost in serving users; (vi) improved quality of user-services; and (vii) for providing facilities for equal access to every user. The task to implement good governance in the management of any system is complicated and vast. Five essential elements are identified: "vision (objectives), skills (qualities of the personnel), incentives (rewarding the personnel, motivation for personnel), resources (money, material, manpower i.e. 3M & communication facilities) and action plan(planning for management i.e. a good MIS).

2.2 G2C Interface

In G2C interface prototype, human face comes in the form of citizens and their level of engagement with the government initiatives is very important. This can be done by the application of right technology. Thus an Information Communication Technology (ICT) enabled 'G2C interface' can minimize the response time to address any problem of citizens as well as information can easily be accessible to everyone.

To provide the facilities for information retrieval to each and every citizen, the Government of Manipur has formulated its IT policy in the current year (2003). Some provisions of the said IT policy may be rephrased here to find the guidelines for extension of services to the citizens (i.e. G2C interface).

(i) **State Wide Area Network**: The State shall establish a 'wide area network' covering various departments of Manipur through VSAT, Fiber Optics and Radio links. The network will facilitate multi-service such as, video conferencing, file transfer facility, e-mail, online application processing, query and response, etc.

(ii) **Transaction Information Data Banks**: To achieve accountability and efficiency in administration, the state shall develop databases for the related information.

(iii) **SMART Cards**: A multifunctional electronic SMART card will be issued to citizens that enable citizens to interact with services, make payments and serve as ration card, driving license and identity card etc.

(iv) **Standardization of IT Infrastructure**: The departmental IT infrastructure will be procured according to the specifications and standardization laid down by the IT department. Standardization of data structure shall also be carried out by organizations up to the feasible extent. These steps are necessary for the creation of centralized data warehouse.

(v) **Use of GIS Technology**: 'A geographical Information System'(GIS) will be developed, which will be used in integrating, analyzing and visualizing different types of data for special planning, environmental protection, utility management and traffic regulation.

(vi) **IT Budget**: Each department and corporation shall earmark 3% of its budget for IT application. The allocated budget shall be spent on procurement of IT infrastructure.

(vii) **Digital Library**: The state shall develop a digital library, which would be a central storehouse of digitized data containing government records and other information, such as academic, industry, tourism and archeology.

2.3 National Informatics Centers (NIC)

NIC is an organization of IT under the Ministry of Communication and Information Technology. The NIC, Imphal has started functioning in the year 1988. Other district centers of the NIC of Manipur became operational in the year 1990. The NIC of Manipur is actively trying to implement e-G solutions to the GOM. "Citizen-Centric" services are the high priority for implementation of G2C interface in the state.

2.4 Community Information Centers (CICs)

Community Information Centers (CICs) are also block-level IT Organizations under the same ministry of NIC. So far, 33 different blocks of Manipur has been established CICs. All CICs are connected to the District and "State Information Centers" through VSAT. Each CIC is having 6 computers and 2 CICs operators for managing and providing services to the public. Some of the services provided by the CICs are internet access, e-mail service, database retrieval, computer awareness training programme, etc. Any users are also allowed to operate on these computers.

3. INFLIBNET PROGRAMME IN MANIPUR UNIVERSITY (MU) AND PROBLEMS

The Manipur University Library was declared as one of the INFLIBNET nodes in the year 1993. The center has been actively participating in all programme which were arranged by the INFLIBNET from time to time. The UGC has released required sanctions to meet the expenditure for the automation of the Library. The University has also procured most of the items as per configuration prescribed by the INFLIBNET.

Even with a number of limitations, the INFLIBNET section has, however provided commendable services to MU Library,

particularly in its effort of library automation. Other notable services provided by the section are directed to the benefits of the user-communities. It has been able to:

i) connect to other libraries of the country;
ii) utilize information-resources of the MU Library;
iii) check duplicate purchasing in the library;
iv) provide reliable access tc the "Online Union Catalogue" of documents created from the collections of different libraries;
v) open the e-mail facilities for the scientists, researchers, faculties, staffs and students;
vi) provide OPAC to different departments through campus network over the web: and
vii) offer the facilities for downloading e-papers from different places(print/non print media).

However, a number of gaps can be identified in between the ideal and real situation on different components as shown in the below Table -1.

Table - 1 Gaps identified in between the ideal and real situation on different components

	COMPONENTS	IDEAL SITUATION	REAL SITUATION
I	User Requirement (UR)	Full updated knowledge	Incomplete knowledge
II	Availability of Planned Resources (PR)	Complete planned resources	Partial
III	Manpower Requirement	Both Operator & Administrator	Only operator
IV	Technological infrastructure problem (HW/SW etc.)	High configuration with sufficient number of machines and updated software	Insufficient number of machines and old software
V	Standard (Database/Communicat ion etc.)	Standard required	Standard not maintained
VI	Time Factor	Economic (time should be spent)	Expensive (more time taken to complete)
VII	Dissemination mechanism	Faster/ Accurate/ To the Point	Traditional (Slow)
VIII	Geographical area for dissemination	All over State and outside State	Limited to MU Campus only
IX	Internet access bandwidth	High internet access bandwidth	Very low/unreliable internet access bandwidth

4. e-G AND G2C MODEL FOR INFLIBNET PROGRAMME: PROPOSED ROADMAPS

A four phase model of e-governance is also used in INFLIBNET programme :

i) Selection and accumulation of bibliographical data (BD);
ii) Interaction with user (user-study) to know their requirement and searching behavior/ pattern (through various e-methods like e-mail, e-chat, etc);
iii) Integration and storage of BDs as per user's requirement/ searching behavior.
iv) Transferring BDs to the end-users with their full satisfaction (making the searching and transferring process simple, user-friendly, economic and time saving) – "transactions can be done by any user from any place and at any time without visiting the center.

What is required now is to review the infra-structural set-up of present INFLIBNET unit of MU Library in the line of 'roadmap' as shown at Fig. 1 exhibit. It is expected that, the gap between ideal situation and real performance as pointed out above may be narrowed down incase the 'roadmap' for e-G is followed.

Similarly, G2C Interface policy of GOM, incase adapted for the dissemination of information (from INFLIBNET Database), will certainly minimize the gap regarding dissemination and retrieval facilities. Based on "Government to Citizen" programme, the concept "INFLIBNET to Citizen" can be introduced for reaching to every citizen all over the state. The IT policy of GOM (some noted above) has brought an opportunity for INFLIBNET to reach to the citizens using the same infra-structural set-up of the Government. By establishing a 'consortium' with GOM (State Wide Area Network), NICs and CICs set-up by central Government (as shown in roadmap Fig. 2), the INFLIBNET service can be reached easily to the citizen of the state without incurring any additional expenditure. It is expected that the GOM, too, will be ready to entertain and encourage such proposal for the betterment of the citizen of the state. The citizen (particularly the academic community at all level) living at any place, will ultimately be benefited incase the INFLIBNET becomes an ally and part of the IT programme of the GOM. Let the GOM, NIC, CICs and the INFLIBNET center of MU Library work together by forming an effective 'consortium' to make the citizen of the state information literate. The details of the roadmaps are required to be formulated for the efficient and effective implementation of such objective.

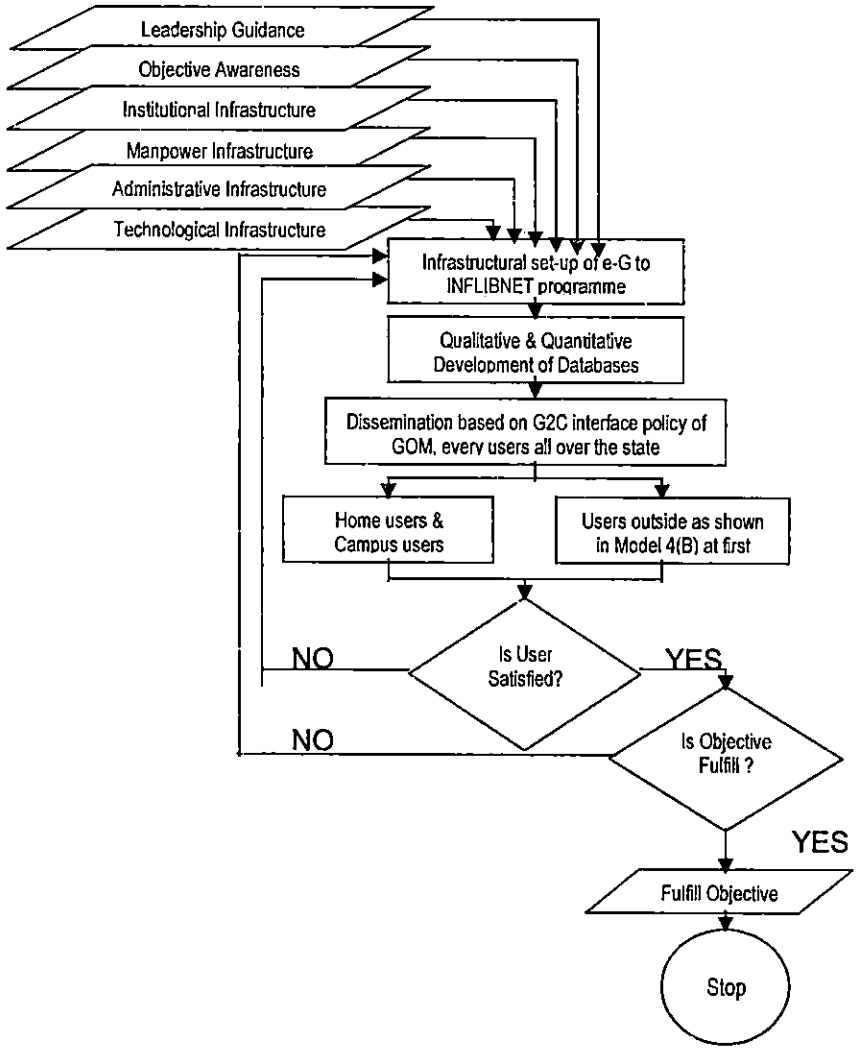


Fig. 1 'Roadmap' for the Organizing INFLIBNET, MU Center

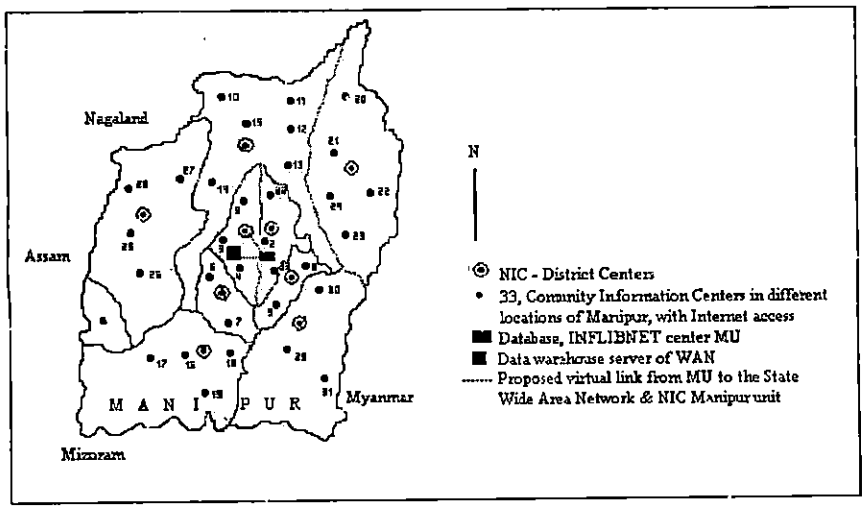


Fig. 2 Roadmap for Services of INFLIBNET, MU based on G2C interface Policy of GOM (Phase-I) and by forming 'consortium'

5. BARRIERS

A number of barriers are expected in implementing e-governance to the INFLIBNET programme. Some are commonly known as: (i) cost of equipment (ii) technical support (iii) reliable power supply (iv) access to telephone network (v) internet service providers (vi) telecommunications bandwidth (vii) knowledge of staff regarding equipments and value of use (viii) on-line resource materials (ix) Standardization of resources (x) Maintenance of Databases (xi) organizational structure (xii) cost of telecommunication within and outside country etc.

6. CONCLUSION

The 'roadmaps' are designed for qualitative output, better service and for larger audience/user/recipient community. The budget-requirement to implement such joint-endeavor will certainly not ask for any big additional economic commitment because of the existence of proposed "State Wide Area Network" of GOM. By sharing economic resources, e-infrastructure and expertise of each other through consortium, all the e-systems of the State will be, expectedly, more efficient and more effective in creating "State Wide Area Network". The monitory-package supposed to be borne

by the State Govt. on technological-infrastructure under its IT policy 2003 will be rewarded only when technologies provided are used appropriately by all sections. With such technological support, the "gaps" observed in the INFLIBNET-functioning are expected to be narrower in some cases.

The successful implementation of both the roadmaps may also call for a new set of responsibilities for both the personnel and the end users associated with the same. Library and computer/ network staff and managers "need to know enough about each other's area of expertise so that they can communicate properly". The real needs of the different sections of the users must be taken into account in the roadmaps. Service centers/work stations "need to be suitably designed for its likely users". The users need to be guided properly by the well-trained personnel so that the former could learn "to surf the network" and sometimes "to swim in information without drowning in data". Human factors should, therefore, be considered at all stages of any e-system.

7. THE EPILOGUE

Will it be possible for this proposed 'consortium' to find a root in reality? Will it be viable incase it finds root? Or, whether will it remain only in 'myth'? The matter has informally been drawn to the attention of three e-experts (*) from the NIC and the GOM. The first hand views expressed by them (verbally) are, however, not discouraging:

- The NIC Imphal unit can provide necessary memory allocation for parking website of Manipur University provided a formal request is made by the University. The website will be a controlled one which can record the particulars of the users visited once. This type of website will be very useful for the future extension. The website and database can be updated either by the NIC or by the institution itself depending on the policy formulated.
- Having a home website is very useful especially for home users. Technically, launching a website is not difficult incase INFLIBNET center MU has clear understanding with INFLIBNET Ahmedabad.
- The MU INFLIBNET databases can be loaded in the centrally located server of the WAN when it is finally established (as proposed in the IT policy, 2003 of GOM). However, the agreement between the INFLIBNET and the GOM is necessary in this connection.

The responses are quite positive. But the 'roadmap' for such proposed 'consortium' needs further examination in detail at every level before implementation. Meanwhile, as pointed out by the e-experts, are the INFLIBNET center, Ahemedabad and the University management ready to give 'green signal' for such 'consortium'?

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(*) SIO, NIC Manipur unit, Scientific Officer of Department of Science & Technology, GOM and Director of Department of Science & Technology, GOM were kind enough to have a talk with the author on 28-11-2003 at their respective offices.

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THE LIBRARY AND ELECTRONIC RECORDING TECHNOLOGY (ERT)

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ABSTRACT

Electronic Recording Technology (ERT) is a boon for the Library. With the help of ERT Librarian can digitize his/her old internal documents and thus enable to retain human record of knowledge in a better way for long time. This ERT generates some influence on library environment. Identified the essential things to do in favour of changing environment in libraries. Describe the users demand and librarians approach to entertain that demand in new environment in library. Identifies major media storage and search tools for digitize knowledge through ERT. The roles of Librarian for implication the ERT in libraries are discussed. Concludes this new roles and skills are essential to enhance Library professional/Librarians capabilities to provide effective services to it clientele.

1. INTRODUCTION

Recently one important change has taken place in library field, which has changed the environment of the library, i.e. Electronic Recording Technology (ERT) or digitization technology media and its dominancy in society. Library has also welcomed this new system, as it is not out of the society. Moreover, librarians and its parent institutions have realized that this ERT is a boon for the library. And by the help of this ERT, librarian will be able to invite more confidently its clientele as before. So many Libraries and Information Centres are engaged to use ERT for their existing documents and to serve their clientele.

2. ENVIRONMENTAL CHANGES IN UNIVERSITY LIBRARIES

The need for education and research of any university is always highly dependant on its library. But it is impossible to procure all the necessary documents/data/information even for any single subject in any university as the growth of information/publication in any subject is going on very high speed and in multifarious media technology.

Knowledge is rapidly expanding, even in any particular subject, in the proliferation of books and other documents i.e., newsletters, magazines and journals etc. on the topic/subject. The sheer volume of these materials has made storing and accessing them a major and increasingly expensive task for libraries through out the world. Space limitations are one constraint; accessing the information is another. A very common demand from academic departments is that major journals of different subjects must be subscribed to, and provision should be there to consult those journals individually into the library.

But to face the demands of modern readers soon it is realized that this manual system is not sufficient. To face the demands of users, university librarians have introduced automation, a new environment to his/her library. Librarian has taken initiative to serve his/her clientele in two ways: 1) from the internal resources of the library and 2) from the external resources. Therefore, a new environment has been developed in a university library where users demand for new knowledge generated anywhere in the world.

For this environmental changes the university librarian should note or emphasize the important phenomena like: technical expertise; visit of other library that have already accepted the scheme; and specifying proposed area to be covered or what will be the first choice for the site or library. And it is true that it would be too expensive to switch over the traditional library to digital library.

3. THE ELECTRONIC RECORDING TECHNOLOGY (ERT)

The Electronic Recording Technology (ERT) has provided alternative to the traditional methods and procedure of recording human knowledge including primitive knowledge. It has enabled to record human knowledge in better way, in digitized form. The ERT system captures print records in such a way that they have exact

contents, context and structure. So digitized records from print media are authentic, authoritative, reliable and purposeful. The advantage of digitized media record is that it remained available, understandable and usable for long period.

To start the ERT system in the library, some basic components are required for the organization where a digital library is to be attached / augmented. These components are as under:

a) Local Area Network (LAN)
b) Nodes connected with computers (PCs)
c) Stable Server to store huge information/knowledge
d) CD-Rom Collections and CD-Drive
e) Multimedia Kit
f) Internet facilities
g) Speedy Communication System
h) E-mail, Fax, Voice Message services
i) Manpower with sound computer knowledge
j) Software for operation and searching
k) Printer, Scanner, Copier, etc.

Hardware requirements

a) Server, b) PC, c) Scanner, d) Camera, e) CD Writer, f) Storage media e.g. CD; DVD; Hard Disk; Floppy. Juke Box CDH to load more CD at a time. CD Server.

Software requirements

a) Operating System (OS); b) Scanners have software in built. For detailed bibliographic information, indexing of scanning items/images and their retrieval purposes Optical Character Recognition (OCR) method is used to scan. Although for old documents many other scanning/image solutions software are available in the market, viz. VISUAL; Data Scan; Omni Page; Q Series; Tech Lib; GEAC, etc

3.1 The ERT Process

Librarian can use scanning methods for digitizing his internal old and rare documents. For this purpose several scanners have to be used depending the nature and type of original document. To scan documents scanner's resolution is very important. High resolution affects the level of details of image of the original document. Presently the scanning resolution varies from 200 to 600 dpi (dot per inch).

Another thing is important for the image that is its colour. It depends on number of pixels, which are small cells or blocks of tones. Normally we have three methods; 1-bit or Bi-toned, Gray Scale Image and Colour Image on which the colour of the image of a document depends.

The quality of scanner is measured by the number pixels per unit. Most scanners can read at least 300 dots per inch. More dots mean better resolution: finer lines and sharper pictures/images.

3.2 The Image Acquisition Processing

Imaging is one of the ERT processes, which has several steps from original document to digital image form (Gonzalez and Woods, 2003). All these steps are to be found in the figure – 1.

From the stated figure we may get the idea how conversions of a library document, say manuscript, into digital image forms by the help of ERT. The figure shows that the energy has been transmitted from an illumination source as "A", and that is being reflected from a scene element i.e. manuscript (library document) as noted here "B". This energy could also be transmitted through the scene element (library manuscript). Now the imaging system,

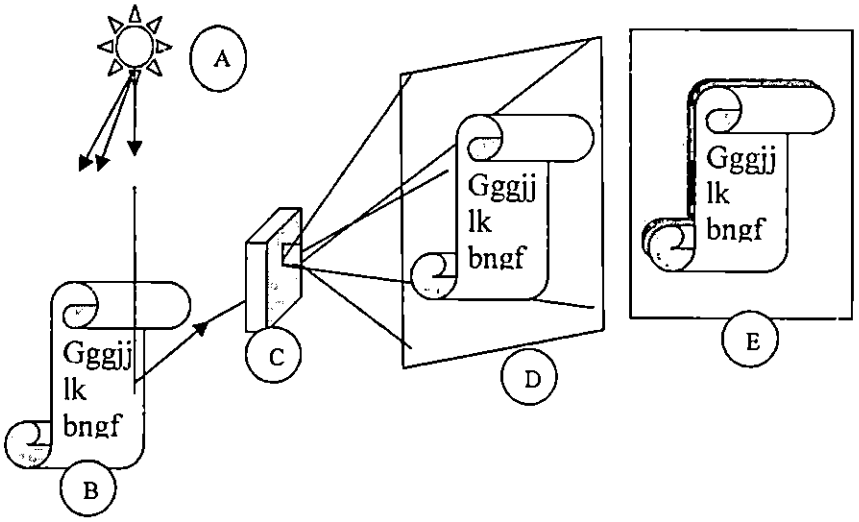


Fig. 1 An example of Digital Image Acquisition Process

***Notes**: A = Energy (illumination) source; B = Scene element (Library manuscript); C = Imaging system (scanner, etc.); D = Image plane (Library manuscript); E = Digital Image (Library manuscript).*

which is shown as "C", has to perform two functions: to collect the incoming energy and focus it onto an image plane as we mark here "D". Here, the illumination is light and the front end of the imaging system is a lens, which projects the viewed scene onto the lens focal plane. Now the sensor array, which is coincident with the focal plane, produces output proportional to the integral of the light received at each sensor. Digital and analog circuitry sweeps these outputs and converts them to a video signal, which is then digitized by another section of imaging system. Thus we get the output of a digital image of the manuscript (library document), as shown in "E". Thus, after getting individual image one by one, computer itself generates and stores these images into computer as ERT files.

3.3 ERT files and recommended formats

Data can be digitized in a text file, image, audio, video or multimedia process. A number of bytes are required to represent data and for multimedia data huge number of bytes are required. To represent digitally 1 second of video requires 160 megabytes. Two minutes of CD quality music requires more than 84 millions bytes. Therefore, the high capacities of storage device techniques are to be required to store the digitized image, audio, video and multimedia data. Some commonly used image compression techniques are: CALIS, DMC, JPEG, JPEG-LS, JPEG 2000, MPEG, JBIG, JBIG-2, GIF, LBG, PDF, Photo CD, TIFF, CCITT Group 4, Hoffman Coding, etc. The universally accepted formats for various types of files that are related to ERT are noted in Table - 1.

Table – 1 File formats relating to ERT

Serial No.	File Types	Universally accepted formats / Standards for representing the file
1.	Text	ASCII (.txt), DOC (.doc), PDF (.pdf), HTML, SGML
2.	Image	CGM (.cgm), GIF (.gif), JPEG (.jpg), TIFF (.tif), BMP (.bmp), PGM (.pgm), PPM (.ppm)
3.	Audio	AIF (.aif), MIDI (.midi), MP3, MPEG-2 (.mpg), WAV (.wav), SND (.snd)
4.	Video	MPEG-1 and MPEG-2 (.mpg), Apple Quick Time (.mov)
5.	Multimedia	Auto CAD (.dxf), Adobe Photoshop, Flash

Libraries have many old and rare documents to be digitized in the new environment therefore, the question of space for storage is also came in front automatically. The solutions are also readily available for librarians, if they accept the data compression method to store their digitized documents.

3.4 Data Compression

Data compression is one of the enabling technologies to put image, audio, video and multimedia in computers. Data compression, according to K Sayood (2000), is the art or science of representing digitized information in a compact form. By using data compression the digitized data again restructured. The total process may be represented thus in Fig. 2.

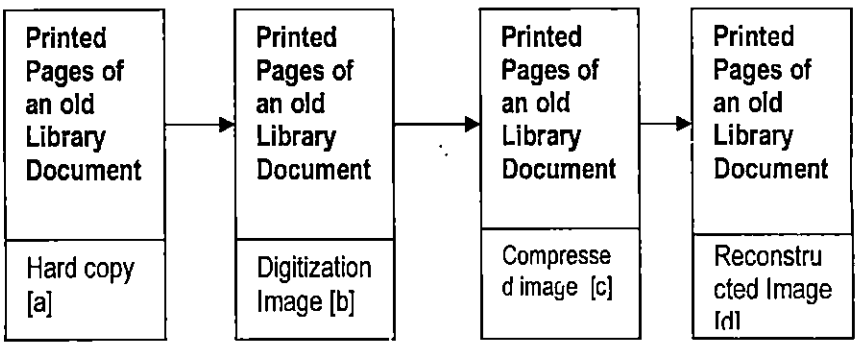


Fig. 2 Application of Data Compression on old printed library documents

From the above example of compression technique in figure – 1, it may be clear about the Compression Schemes, we have library documents in print version as [a]. This [a] scanned as an exact copy of original printed document and called as digitized image [b]. By using compression scheme this [b] can be compressed and thus we can have the compressed image [c]. And, this compressed image involves with some restructuring process and finally, converted as reconstructed image [d]. If we follow the lossy scheme of compression then [d] will be different from [b], but if we take the help of lossless scheme of compression this [d] will be identical to [b]. It is obvious that lossless scheme of compression is much better relating to digitize and compression of old library document as it represents the original documents identical.

The data compression schemes are of two types: (i) Lossy Compression Scheme and (ii) Lossless Compression Scheme. In Lossy Compression Scheme it involves some loss of data/images, which are compressed and so data/images cannot be recovered or reconstructed exactly. In case of Lossless Compression Scheme data/image are compressed without loss of information and the original data/images can be recovered or reconstructed exactly from the compressed data/images.

Now the question will naturally come how we will retrieve these compressed data? With the help of data mining and optical character recognition it can be solved automatically.

3.5 Data Mining

In the word of Bigus (1996), "Data mining is the efficient discovery of valuable, non obvious information from a large collection of data". Data mining is a method of search from very large databases. It is also known as knowledge discover tool, which identifies the relationships in data. It includes tasks of knowledge extension, data archeology, data exploration, data pattern processing, data dredging, and information harvesting. All this activities are conducted automatically and allow quick discovery to the computer skilled person as well as the non-programmer. According to Tarban & Avenson (2001), the following are the major characteristics and objectivities of the data mining:

- Data are often buried deep within very large databases, which sometimes contain data from several years. In some cases, data are consolidated in a data warehouse.
- The data-mining environment is usually that of client/server architecture.
- The miner is often an end user, empowered by data drills and other query tools to ask ad-hock questions and obtain answers quickly with little or no programming skill.
- Data mining tools are easily combined with spreadsheets and other software development tools. Thus, the mined data can be analyzed and processed quickly and easily.

3.6 Optical Character Recognition (OCR)

Optical character Recognition (OCR) is a machine process that turns visible alphanumeric signs into coded data according to the standard pattern of recognition. OCR system scans data and produce an image of the input item or page or document and use to convert the scanned image into the corresponding ASCII code, i.e. the code by which the computer processes textual information or file.

Scanners are of several types: small handhold scanners, which can be used to read a few rows of dots at one time. Flatbed scanners are those, which scan the entire page automatically and store that page as an image in a file of computer. Scanner also can be used to input text and data into computer. Scanners first convert the page into a picture of dots, then OCR software examines picture and looks for text. The OCR software checks each line and deciphers one character at a time. OCR can convert handwriting to computer text. It also can convert typed characters to computer text. It is obviously true that deciphering individual handwriting is much more difficult than reading typed characters for OCR software (Post and Anderson, 1998). Still it is very much needed to use flatbed scanner with OCR software for ERT and purpose of digitizing the old and rare library documents, and Manuscripts.

4. LIBRARIANS ROLE

In the new library environment, librarians have no doubt a great and fundamental role. It is the primary motto of librarians to serve his clientele pin-pointedly, expeditiously and exhaustively. The working Librarians should have the proper knowledge of Information and Communication Technology (ICT), if not acquired it beforehand to enter into the Library Profession (Nandi 2002). For the planning and supervision of ERT, some knowledge on ICT is most essential. And for that, he should know the new dimension of the following area of Information and Communication Technology, basic media technology and tools required for the purpose and IT based library working processes which may be stated in the following Table - 2.

Table - 2 Area of Information and Communication Technology (ICT), basic Media Technology and tools required for the IT based Library working processes

Area of Information and Communication Technology	Basic media technology and tools	IT based Library working process
Document Storage devices	Floppy diskette, CD-ROM, Data base, E-book, E-journal, etc.	Proper Staking/ storage of knowledge
Documents Processing	PC, Disk driver, CD-ROM driver, Scanner, Data base, etc.	Computer Acquisition, Processing, Circulation, Reference, Periodical, & Documentation Work
Equipments	PC, LAN, Printer, Scanner, CD writer, Barcode Scanner, Telephone with Internet, Fax and E-mail connectivity, Library software, etc.	Media and equipment handling knowledge
Clientele Approach	On-line search through Terminals and INTERNET	Understanding of intra-library LAN, terminals and INTERNET
Delivery of Documents	Physical and On-line searching Hard Copy, E-copy, through E-mail, Fax, Internet, etc.	Skill of searching e-books & e-journals, data bases, and handling e-mail, Fax, Internet, etc.
Library Personnel	Skill for computer operation in changed ERT environment	Training; Orientation; Self Learning; PC Operation for Library House Keeping Jobs

5. CONCLUSION

In conclusion it may said that digital encoding as patterns of bits represents the database texts, images, graphics, and sounds. The librarian should keep in his mind in creation of local database that it will be presentable on the World Wide Web and therefore, he must accept one of the standards, i.e., ASCII, Unicode, JPEG, TIFF, WAV and MP3 as these allow for the encoding, storage, exchange, and decoding of multimedia information of database (Nandi, 2003).

A new horizon has been opened before librarians for acquisition, preservation and storage, and retrieval of old, rare, fragile documents and non-book materials, specially manuscripts those were in his/her holdings since long back. Librarian can digitize those documents with the help of ERT system. It is also important to note that the service normally rendered by the librarian to its clientele will be more qualitative and accurate if this ERT system accepted to the particular library. So, we can conclude by saying that ERT system enriches the skill of librarians and capable him/her to provide effective library service to the users circle.

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APPLICATION OF INTEGRATED RFID TECHNOLOGY IN LIBRARIES

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ABSTRACT

Radio Frequency IDentification (RFID) is an exciting new technology being applied within libraries. The use of RFID brings new functionality, such as multiple item checkout and check-in, rapid inventories on shelves, and book returns with instant item identification, automatic re-activation of the anti-theft function and database. Recent notoriety about RFID has lead to a degree of confusion and misinformation surrounding the technology. This presentation examines the RFID tags structure and it usefulness for libraries. And also describes the RFID myths and realities and compares its usefulness with the barcode technology. The paper describes the benefits and limitations of the technology and the current state of library best practice.

1. INTRODUCTION

Radio Frequency Identification (RFID) is the latest technology being used in library theft detection systems. Unlike EM (Electro-Mechanical) and RF (Radio Frequency) systems, which have been used in libraries for decades in developed countries, RFID-based systems move beyond security to become tracking systems that combine security with more efficient tracking of materials throughout the library, including easier and faster charge and discharge, inventorying, and materials handling.

New technologies have always been of interest to libraries, increasing the quality of service and for improving efficiency of operations. At present time, when all types of libraries are faced with economic hardships, the overwhelming reason for introducing new technologies is the potential for cost savings in the operations and the management of materials flows.

2. RFID V/s BAR CODE

RFID uses tiny computer chips smaller than a grain of sand to truck items at a distance. Each tiny chip up to an antenna that picks up electromagnetic energy beamed at it from a reader device. When it pick up the energy, the chip sends back its unique identification number to the reader device, allowing the items to be remotely identified.

Bar codes cannot be the signal feed for anti-theft systems so the usual combination is to have a combination of bar codes for identification, and some electromagnetic (EM) based anti-theft system. In self service stations the identification system must interact with the anti-theft system so that items have the correct (EM) state after the circulation transactions, i.e. checked-out item must be deactivated, and returned items activated.

RFID technology differs from bar codes. With RFID, each individual can of coke would have a unique ID number, which could be linked to the person buying it when they scan a credit card or a frequent shopper card. Unlike a bar code, these chips can be read from a distance, right through your clothes, wallet, backpack or purse – without your knowledge or consent – by anybody with the right reader device. In a way, it gives strangers x-ray vision powers to spy on you, to identify both you and the things you are wearing and carrying.

3. RFID IN LIBRARY

RFID is used in libraries primarily to automate the book handling process including checkout, inventory maintenance, and check-in. When combined with automatic or Computer Assisted shorting equipment, RFID facilitates and speeds up book sorting. Automating this process allows librarians to spend more time with customers increasing customer satisfaction.

4. BENEFITS OF RFID FOR LIBRARIES

(i) It is fast on-the-shelf inventory and allows for much better accuracy in collection management and increased book turns resulting in reduced book purchasing. This allows libraries to expand their collections without increasing their budgets.

(ii) RFID tags replace both the bar code and EAS (anti-theft) device allowing for much faster conversion of library materials in new branches. In existing libraries, RFID tags can co-exist with existing EM anti-theft systems. This approach varies from vendor to vendor –

the security mechanism may be integrated into the chip itself, or security gates may be linked to a separate server, which interrogates the database to conclude whether an alarm needs to be triggered.

(iii) Checkout stations can be automated with easy, intuitive interfaces. The checkout is automatic and disables security mechanisms in the books that would otherwise set off alarms at the door. If libraries outfit library cards with RFID chips too, patrons don't even have to remove them from their wallets in order to check out

(iv) Book returns can be automated with check-in, EAS activation, and systems updates completed simultaneously in the book return chute.

(v) Sorting can be accomplished automatically with RFID. As books are dropped into the book drop. Automatic sorting system returns the book back to shelves, the stacks or the hold area.

(vi) Finally, RFID tags last longer than barcodes because nothing comes into contact with them. Most RFID vendors claim a minimum of 100,000 transactions before a tag may need to be replaced.

5. DISADVANTAGES OF RFID SYSTEMS FOR LIBRARIES

5.1 Vulnerability to compromise

It is possible to compromise an RFID system by wrapping the protected material in two to three layers of ordinary household foil to block the radio signal. Clearly, bringing household foil into a library using RFID would represent premeditated theft, just as bringing a magnet into a library using EM technology would be. It is also possible to compromise an RFID system by placing two items against one another so that one tag overlays another. That may cancel out the signals. This requires knowledge of the technology and careful alignment.

5.2 Removal of tags

The RFID tags are typically affixed to the inside back cover of the book. Enterprising thieves could easily remove the tags and subvert the security gates. This problem is mitigated somewhat by using customized labels for the tags which make the RFID tags appear more like a book plate. Another security threat is frequency blocking. Wrapping them in household foil can block the

some tags. Blocking may not always be so deliberate. If tags overlap then the signal is blocked. The author found no evidence of removal in the libraries he visited, nor did any of the library administrators contacted by telephone report a problem. That does not mean that there won't be problems when patrons become more familiar with the role of the tags.

If a library wishes, it can insert the RFID tags in the spines of all except thin books, however, not all RFID tags are flexible enough. A library can also imprint the RFID tags with its logo and make them appear to be bookplates, or it can put a printed cover label over each tag.

5.3 Sensor problems

While the short-range readers used for circulation charge and discharge and inventorying appear to read the tags 100 percent of the time, the performance of the exit sensors is more problematic. They must read tags at up to twice the distance of the other readers. The author knows of no library that has done a before and after inventory to determine the loss rate when RFID is used for security. Lacking data, one can only conjecture that the performance of exist sensors is better when the antennae on the tags are larger.

5.4 Privacy

There is a perception among some that RFID is a threat to patron privacy. That perception is based on two misconceptions: (1) that the tags contain patron information and (2) that they can be read after someone has taken the materials to home or office.

The vast majority of the tags installed in library materials contain only the item ID, usually the same number that previously has been stored on a barcode. The link between borrower and the borrowed material is maintained in the circulation module of the automated library system, and is broken when the material is returned. When additional information is stored on the tag, it consists of information about the item, including holding location, call number, and rarely author/title. The RFID tags can only be read from a distance of two feet or less because the tags reflect a signal that comes from a reader or sensor. It is, therefore, not possible for someone to read tags from the street or an office-building hallway. Perceptions, even when mistaken, may have real consequences. It is, therefore, important to educate library staff and patrons about the RFID technology used in libraries before implementing a program. The best way to do that is to emphasize

that RFID technology is not one technology, but several. E-Z pass is meant to be read from a distance. It would be impractical to affix tags of that size and cost to library materials. The same is true of the tags used on pallets in warehouses.

In India, a problem of considering legislation that would pose restrictions on the use of RFID by retailers and libraries. It is, therefore, important to monitor legislative activity and to be prepared to inform legislators about the differences between retail and library applications. Library administrators should be sure to keep their boards informed.

5.5 Cost of implementing RFID system in libraries

The major disadvantage of RFID technology is its cost. While the readers and sensors used to read the information are comparable in cost to the components of a typical EM or RF theft detection system, typically $2,500 to $3,500 or more each; a server costing as much as $15,000 may be required and the tags cost $0.60 to $0.85 each. It may be some time before the cost of tags comes down to $0.50 or less, the figure which polling of librarians has determined is the key to their serious consideration of the technology.

5.6 RFID Standards

The International Organization for Standardization (ISO) and EPC Global has been very active in developing RFID standards. There are two standards pertinent to library RFID systems, the current standards, ISO 15693, was not designed for item-level tracking done in libraries. The ISO 15693 was designed for supply chain applications. In September 2004, a new standard designed for item-level tagging is due to be published. It will allow for more secure communication between tag and reader.

6. CONCLUSION

Radio frequency identification tags in libraries have the potential to improve physical access to library materials. They have significant privacy implications, however. These privacy and security flaws are embedded at the tag level and adequate technological solutions have not yet been developed, although legislative interest has regulating the technology is increasing. The prevalence of RFID technology is only increasing now that big interest. RFID will not be going away. Librarians will need to continue monitoring the technology and maintain their professional obligation to protect patron privacy. RFID technology promises to change our world. It has the capability of making our personal

lives and our work lives in the library more convenient. However, every new technology comes at a cost. In order to remediation those cost, efforts must be undertaken to guide its development and implementation.

Libraries should not yet implement RFID systems. Instead, libraries should be among the entities putting pressure on government and industry entities to develop standards, public policy and best practices guidelines for its use. Libraries that choose to implement RFID technologies in advance of policy safeguards being put in place should take extra precautions to follow evolving best practices guidelines. Libraries should continue to protect privacy by ensuring that these are not seen as proponents of RFID before it can be safety developed. Libraries should work to ensure that RFID products are manufactured and used according to well-established privacy principles. Libraries should refuse to implement potentially unsafe RFID solutions simply because they are convenient.

Finally, libraries must be outspoken in their public education efforts related to RFID. Not only are libraries one of many industries who can benefit from the safe implementation of RFID systems, but also because RFID represents the start of a slippery slope to ever greater loss of control over our personal information.

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APPLICATION OF INTRANET IN LIBRARIES

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ABSTRACT

The primary benefit of an Intranet in a library is the facilitation of information, sharing various kinds of documents that can be converted into HTML and made web accessible. Policies, procedures, forms, annual reports, manuals schedules, calendar of events and programs, and anything on paper can be transferred onto an intranet. Most libraries today probably have some form of a computer network. An Intranet can be viewed as simply a logical extension of the trend in libraries towards greater connectivity. This paper will offer a brief introduction to the Intranet and it's intended to act as a guide for libraries contemplating the implementation of their own Intranet. Issues dealt with include the advantages and problems with Intranets, their application within a library setting, some general tips in helping librarians make decision in regards to intranets.

1. INTRODUCTION

In order to manage knowledge we need to understand the nature of knowledge in organization. It is helpful to distinguish among three categories of organizational knowledge - tacit knowledge, explicit knowledge and cultural knowledge, which is based on share knowledge. Intranet is frequently promoted as a route towards the sharing of knowledge in organization. Experience

demonstrates, how ever, that many Intranets were launched without clear objectives or strategy and evolved in an ad-hoc manner, resulting in systems with limited relevance. Intranets are perhaps the hottest applications in the field of telecommunication today. The rapid growth of these application beliefs the fact that it has received little systematic study presents in the academic literature. Present two separate cases of corporate Intranets that have been recently implemented. Intranets hold great promise as "Organizational Internet" to allow information sharing and collaboration across departments, functions and different information system, within an organization.

With the increasing emphasis on resources sharing not only between libraries but also between different branches and departments of a library, the intranets after the potential to be a very important tool in libraries. Effort to make the most efficient use of intranet resources. Presently, it has been corporations, which have been most, embraced Intranets. However, libraries are starting to investigate their capabilities as well.

2. INTRANET

An intranet is service, making use of the technologies of the World Wide Web (Usually HTML over HTTP) to distribute information within a single organization over its internal network. Note that the Intranet is no longer the network itself, but a service runs over it.

It can be broadly defined; an Intranet is an internal network. More specifically, it refers to private internal networks within organization that uses the TCP/IP protocol of the Internet. It is the application of Internet technology on a private network. The major difference between the Internet and Intranet is that an Intranet allows access to the Internet but not vice versa. Advantages of Intranet are mentioned in the following sections:

2.1 Intranets are Cheap

The limited cost in setting up an intranet might seem low. This might be a bit misleading. If you expect your intranet to grow, be prepared for the cost involved with the growth. Before you know it you will need one or more of the following:

(i) a faster web server

(ii) increase disk space and memory

(iii) better application like database connectivity, interactive forms, multimedia support

(iv) increased bandwidth

(v) support staff foe managing your intranet

2.2 Intranet are for all Organization

The success of an Intranet depends on the cost saving and increase in productivity. Also smaller organization may find it easier to cut through all the hype and use Intranet technology right way.

2.3 Platform independent

Intranets will work across a number of platforms and viewed by browser on UNIX based, Macs, Windows, Linux and number of other platforms.

2.4 Intranets does not require intranet connection all the times

Intranet can be up and running by itself without any connection to the outside world. This will be using technologies prevailing on the Internet like web server, browsers, chat scripts, news and mail server etc.

2.5 Intranets require little maintenance

Intranet can grow real fast and do not have a good plan and growth strategy in place, be prepared to spend a lot of time on small, routine maintenance tasks. Adding new publisher, adding users, minting the user database, keeping the content and technology current, coping with growing demand for bandwidth, applications and information.

2.6 Intranet are secure

If your Intranet is not connected to the Internet and you do not provide dial access, you have a lot less to worry about. Even with an incoming connection, you have a number of options to secure your Intranet. Firewalls SSL, password authentication, IP blocking and other techniques are available to secure your Intranet from intruders.

2.7 Intranet are Internal Web

An Intranet is not limited to web sites. You can use simple technology like enterprise – wide email; push technology, news group, chat etc. that are all based on TCP/IP protocols, within the Intranet.

3. IMPLEMENTATION OF INTRANET

The concept of an Intranet sound attractive to any library, the next task is to decide how to implement it. The Internet technology vendors are falling over themselves to offer their solutions for the Intranet but most of these have a fairly hefty price tag, sometimes even for educational sites. How ever it is possible to at least test the water using cheap hardware and free or low cost software.

Because the intranet just reuse Internet technology in more limited environment it is possible to make use of the plethora of free web server, scripting language, USENET news servers and mailing list software that are already widely deployed in the Internet. Indeed it is likely that you have already got some of the software installed at your site if you provide Internet access to your staff or patrons. Teaming this free software up with a free or low cost operating system and a cheap PC and hey presto: you have got an Internet server.

Technical Details (Minimum Requirement)

Server	:	DEC Alpha 3300X AXP,96MB RAM 9GB Disk Storage
Server Name	:	Moondog
O/S	:	OSF/1.v.4.OB
Software Board	:	Apache webserver 1.1.1., Lynx 2,.4 –F M www Alpha 2 CNIDR I Search

These days Linux is usually installed on common hardware with little or no fuss and it can be up and running in a couple of hours. Factor in a day or so to become familiar with the system if you have never done UNIX before and another half day to set up all the services and you are away. Providing management

information from existing database is a bit more involved and will usually require a bit of programming.

Of course there are downsides to the cheapest Linux approach. Firstly you have to pick a chose the tools that you'll need to do the job. There are some suggestions at the end of this article but new packages are appearing daily. The big plus point for the commercial internet packages are appearing daily and it is that they try to provide a single vendor source for all the tools that you'll need, and therefore also a single point of contact when something goes wrong. The commercial packages usually try to provide a unified, friendly front end to the software, whereas Linux tend towards the traditional UNIX text based configuration. And lastly there can sometimes be resistance within an organization to the concept of 'free" software such as Linux and its associated tools, even if they are of a higher quality than some of the commercial products that are available.

4. INTRANET ADVANTAGES IN LIBRARIES

4.1 Inexpensive

Installing intranet does not require particularly expensive equipments, since an intranet user the same software and network equipments as the Internet, and speak the same computer language as the Internet. Organization already with access to the Internet may have much of the hardware and software as shareware, i.e. they are free. According to one sources "one can probably build a simple internet with a spare Pentium machine running Windows NT, shareware web server software and "few other shareware components.

In addition, it is often less expensive to add features and upgrade to an intranet, internet than other competing network system, such as IBM Lotus Notes, because the internet is not a proprietary system.

4.2 Increased efficiency

The Intranet can increase efficiency within an organization by reducing the amount of time an employee spends in searching for policies, procedures, manuals, reports etc. Paper forms and documents and microfilms can all be converted to electronic formats and placed online into an Intranet. Using an effective search interface, these documents can be easily and quickly

retrieved. In addition, Intranets can facilitate people in searching information. Setting up an FAQ pages and referring people to consult it first before asking a person directly can also save time.

4.3 Flexibility and Versatility

Since the Intranet is simply the application of Intranet technology to a private network, it has the flexibility and versatility of the Internet. It can connect a variety of computer formats and offer access to the information using one common interface. Therefore, an organization is not tied to a particular vendor or specific software.

4.4 Security Concerns

One of the most popular ways to protect an Intranet from the Internet is the building of firewalls. A firewall performs two functions, one, to block traffic; the other, to permit traffic. There are numerous software available that allow an organization to restrict access to its Intranet or part of its Intranet.

Firewall provides security to the network using user ID, passwords, encryption techniques etc.
An organization must decide who is to control and maintain the information presented and who has what level of access to what data. Issues of authorization and authentication must be considered in order defined by the security requirements for all firewall:

- Do service default to being denied
- Who will control and maintain the information on the network?
- What about access to the internet from the intranet?
- Most organization allows internal users such as staff, full access, without further authentication. One of the points of using an Intranet is to allow staff to exploit the many resources on the Internet. However, for the general public, restrictions on services may have to be imposed.
- Who will have access to the intranet?

It is recommended that user be divided into common groups and subgroups according to the level of access given to them. For example, General public, staff, Librarian, Circulation Staff, Reference Staff, Cataloguer etc.

- What level of access to the Internet should be given to each group?

- What to be able to limit access to certain period in a day, days of the week, specific dates, range of dates or a combination of these?
- Should access be able to be controlled by IP, subnet, and domain of the inbound users? To be safe. it is usually recommended that unless explicitly, access and services should be denied.
- What sort of authentication techniques to use?
- A constant password or a one-time password, which requires a different password each time, a user logs in.

5. LIBRARY APPLICATION

As in other organizations, the primary benefit of an Intranet in a library is the facilitation of information, sharing various kinds of documents that can be converted into HTML and made web accessible. Policies, procedures, forms, annual reports, manuals schedules, calendar of events and programs, and anything on paper can be transferred onto an intranet. The Intranet will then save as a quick and reliable source for organizational information. In fact anything of interest or use to the staff, either professionally or personally, may be put onto it. Examples may be an article on how to deal with problem (us to mars) book reviews, or a notice of lessons on personal safety. In this way, librarian and other employees, and for some information, the public can be more aware of what is going on at the library.

An Intranet can also provide access to online database such as those of DIALOGs. Here, the ability of an Intranet to restrict access is important. A library probably would want to limit who has access to these databases to only certain groups of staff, and possibly to the paying public. Perhaps only cataloguers can gain access to bibliographic utilities, for example special interfaces will be needed for. Online public access catalogues (OPACs) and Z39.50 gateways to access other database. The Intranet is certainly a step towards a "Virtual Library".

6. CONCLUSION

As said at the beginning, the chances are that if any body is providing internet services for staff or patrons, they have already got at least some of the technology in place. Whether the intranet is something that you need to consider depends on organization, but it is likely that one can reuse existing Internet technology such as the web to provide at least some internal services.

Most libraries today probably have some form of a computer network. An Intranet can be viewed as simply a logical extension of the trend in libraries towards greater connectivity. Part of its churn is that it relies mainly on existing technology and infrastructure. For a library or organization that already has internet access, an intranet is the clever application that fully exploits features of the internets, with its relatively low cost and ease of setup. The many advantages of an intranet to a library make it difficult for it to be ignored.

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NETWORKING SECURITY ASPECTS

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ABSTRACT

Security is a condition in which an entity does not suffer harm from threatening events. It has long been viewed as a vital commodity by information system professional with the growing dependence on network to aid in smooth communication and increased outputs, I industry must become more concerned about the possible security threats can breach network security resulting in costly damages.

Collective information is very valuable and its needs trust worthy security. Information Security has been defined as the combination of Communication Security, Computer Security and Radiation Security (i.e. emissions from devices such as monitors and Printers also known as (TEMPEST) for an information system to be secure. It must have a number of properties viz. service, integrity data integrity data secrecy authentication and non repudiation. There is a opportunity available for unscrupulous individual to eavesdrop on data communication or even to tamper with it so to protect confidentially and integrity of data transfer there is a requirement of data encryption and authentication.

The paper emphasis on working of viruses, internet threats packers, worms, firewalls and also why a growing network must be secured.

RESOURCE SHARING AND NETWORKING IN ACADEMIC INSTITUTION

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ABSTRACT

Revolution has taking place in the field of Resource Sharing after the development of Internet; otherwise it prevailed in the printed media too but was in the slow process. Presently, it has obtained the prominent position in the development of digital library. Now, the scientific literature is being produced at a great speed and its access has become a very important management aspect and it is produced in various forms like primary, secondary or tertiary resources (documents under conventional, neo-conventional, non-conventional and meta-documents). But emphasis is being laid to the original and primary documents. Internationally there is a difference opinion on the issue of e-library or library without walls.

It would not be an exaggeration to state that as we embark on the new century, where knowledge is ubiquitous and also moving irrevocably in the direction of changing the way, we are bound to think about information, knowledge, learning and digital technology. Digital Resources are the best policies/practice for the standard digital learning or for its establishment for providing the best information on the demand.

The important factors among them are the forces of economics, changing technologies and its social impacts, which varies from nation to nation depending upon their information policies. All the nations of the world should adopt a certain common understanding aimed at strengthening collaboration in digital environment for information dissemination with perfection and authenticity. The paper emphasizes the Resource sharing, Networking with advantages, Networking services, implications of resource sharing in the present context of digital library formation including Indian context, digital resources, and online journals and databases.

DESIGNING AND UTILIZATION OF INTRANET IN A KNOWLEDGE MANAGEMENT PERSPECTIVE

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ABSTRACT

The intranet is about exploiting web technology in an organizational context so that the users can better utilize the intranet from a knowledge management perspective. This means to take advantage of the specific features that characterize web technology, to take advantage of the tangible traces of everyday work activities, and to take advantage of the fact that actions on an intranet are not isolated events. The pervading theme in this paper is how to design the intranet to activate the users rather than a preoccupation with technology. The ambition has been to understand why intranets are being underutilized and to influence the way intranets are understood. Another objective has been to design a new framework for intranet implementations in general and for knowledge creation and knowledge sharing in particular. Leveraging the knowledge of the employees becomes increasingly important in the post-industrial society, where organisations depend on networks, co-operation and openness to achieve a competitive edge. In this paper we discuss the current situation and outline the role of information in an intranet environment for the knowledge creation.

ROLE OF NETWORKING AND SECURITY ASPECTS IN LIBRARY SCIENCE

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ABSTRACT

The information scenario today comprises disjoint sources available around the world. Internet serves as a backbone and connects to these sources of information irrespective of their locations. Many networks exist in the world often with different hardware and software. People connected to one network often want to communicate with people attached to a different one. Effective controls provide information system security, that is, the accuracy, integrity, and safety of information system activities and resources. Controls can minimize errors, fraud, and destruction in the internet worked information systems that interconnect today's end users and organizations. Effective controls also provide quality assurance for information systems. That is, they can make a computer-based information system more free of errors, fraud and able to provide information products of higher quality than manual types of information processing. As a manager, responsible for the control of the quality and performance of library assets of networking like hardware, software, network and data are need to be protected by built-in controls to ensure their quality and security.

Hence the paper highlights an Information system controls, Procedural controls, Facility controls like network security encryption, firewalls and Disaster recovery.

A STUDY ON DATA SECURITY OF SRI PADMAVATHI MAHILA UNIVERSITY LIBRAY

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ABSTRACT

With the advent of Digital technology, the possibility of horizontal and vertical integration of knowledge and information has increased significantly. The library and Information professionals must know that today it is not the labour or capital which is the major input; rather it is the information, which has become a strategic resource for Socio-economic development of Nations.

Database creation is the first and foremost responsibility of University Libraries since it allows optimum use of the resources available in an individual library and makes resource sharing possible on national as well as international level. In a University library, data in a computerized form is the end product of long exercise and it works as a source for all the operations of the library. Such data on the disk of computer system is always exposed to risk of viruses and other hazards. As a result, there is a need to provide adequate security for the created database in the University Library. The paper is proposed to understand the procedures adopted in creating database, security problems and preventive measures pertaining to the Sri Padmavathi Mahila University Library.

PREVENTING INTERNET MISUSE THROUGH INTERNET USAGE POLICY IN LIBRARY AND INFORMATION CENTRES

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ABSTRACT

Libraries are the hubs of research activities in any organization, be it corporate or industry. Today the libraries without digital resources are not the libraries. Internet, being one of the biggest digital resources, becoming necessary tool in any library. The libraries have to provide Internet facilities to the clientele. Internet is a new tool in IT era widely used in Library & information Centres by staff as well as clientele. It is a powerful tool of research in academic and special libraries. In these organizations, it is primarily installed for research and office activities. But its use is abused during these hours causing loss in productivity. The paper provides a brief account of Internet misuse and need for formulating an Internet Usage Policy. General guideline, designing, Do's and Don'ts of an Internet Usage Policy and its content have been discussed in the paper. Technical know how for monitoring and implementing Internet Usage policy has been given. Concludes no rule that fits all can be framed but will differ from organization to organization.

FREE ON-LINE JOURNALS IN AGRICULTURE AVAILABLE AT NRCS, INDORE

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ABSTRACT

The paper describes introduces importance of Agricultural research in India with brief account of use of electronic researchers in agriculture. The paper emphasizes the importance of e-journals and their various categories and given comprehensive list of free on-line e-journals in agriculture available for use of scientists and research scholars of NRCS, Indore.

ONLINE INFORMATION RESOURCES AND INTRANET: A CASE STUDY OF NIEPA LIBRARY

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ABSTRACT

Internet contains vast amount of information on each discipline. Exponential growth of published, unpublished and e-resources has posed several challenges to the information professionals in managing the knowledge. The paper focuses on the need of intranet to manage organizational products/knowledge, e-resources and render online services in NIEPA. In this paper, an effort has been made to discuss how the information, knowledge and expertise can best be leveraged and shared across the organization through intranet portal technology and pursue the best practices and opportunities in the Web-enabled infrastructure and environment. The best practice to share the online resources of the Internet across the organization is to identify useful sites of online resources on Internet both national and international and link the same with the organizational portal to offer immediate access to the class of academicians, policy makers and research scholars. The paper highlights that access of intranet as well as Internet can be made effective by making efforts to organize organizational knowledge and electronic resources in the portal in a more systematic way.

1. INTRODUCTION

Information is a valuable source for all kinds of organizations. The world economy has transitioned from the industrial age to information age and this new age has posed several challenges to the information professionals in storage, access and dissemination of information. Academicians, administrators, decision makers and business community rely on accurate, relevant, timely and easily accessible information that may assist them in decision making. The value of information is determined by its importance to the administrators, decision-makers and academicians for the end result of their research and decision being made. Today users need information that should accurate, timely and relevant but also presented, interpreted and filtered in a meaningful way. "Collection and dissemination of data and information and the creation and sharing of knowledge are crucial to the success of an organization in the age of global competitiveness" (Thakur, 2003).

Technology has been an important driving force for change. Emergence of Internet, portal technology and rise of e-resources has brought a revolution in the information storage, processing, retrieval and dissemination of all forms of information worldwide. Internet houses a vast amount of information, data, facts and resources. The potential value of the Internet to academicians and researchers is endless. In the era of IT revolution people can access global information from their computers at home, office or cyber cafe. The concept of creating popular Internet portals is moving into the corporate and academic world very fast. The purpose of informative sites on the Internet is to provide fast and easy access to relevant information round the clock from any location of the world.

2. ADVANTAGES OF ONLINE INFORMATION RESOURCES

Online resources have brought a sea change in the acquisition, storing, retrieving and using of information. Thakur and Thakur (2002) in their study have pointed the following advantages of online information resources.

(i) Online resources can be produced, retrieved and disseminated very rapidly among the users than printed publications. On the other hand, printed resources take more time to produce and distribute.

(ii) Electronic text can be edited, corrected, updated, manipulated immediately where as a book will go to a new edition for any change and correction.

(iii) Information in electronic format can be used simultaneously by more than one user at the same time in different computing platforms.

(iv) Online resources make the searches much easier than traditional printed searches. It makes the availability of articles to researchers and produce powerful results round the clock.

(v) Online resources can be disseminated throughout the globe by the World Wide Web. There is no need for separate rights negotiations for different countries.

(vi) Electronic information can be copied and stored for future purpose.

(vii) In an electronic environment, a reader may request to deliver only that part of document which meets the search requirement.

(viii) Electronic resources do not require more space as required for storing paper volumes.

(ix) In an effective electronic environment, valuable market-research data about the users can be collected very rapidly and cheaply than the printed world.

(x) Through electronic publications, it is easy to search the market.

(xi) Online resources are conducive to long-term preservation.

(xii) In an electronic environment, libraries can access and share the information resources effectively with other libraries.

(xiii) Online information resources encourage the paperless office

(xiv) It establishes the ISO 14000 that is environment friendly.

(xv) Electronic resources avoid the duplicate works and efforts of the staff, save economy and energy.

The dissemination of up to date, accurate, relevant and filtered information to users will be the main aim of future libraries and information centres. The major problem behind the proliferation of knowledge is to scan the accurate, relevant and up to date information. Online resources provide the solution to collect and disseminate right information to the right people at the right time to make the most effective use of information.

3. INTRANET AT NIEPA LIBRARY AND DOCUMENTATION CENTRE

The term 'intranet' refers to a computer network built upon Internet technologies in which access is restricted to a particular group of users, typically employees of the organization. "When that network is expanded to include other authorized users the term 'extranet' is sometimes used" (Watson, 1999). Lang (2001) stated, "That all human knowledge could be put into one book" Intranet is a network technology that connects people of the organization to access the organizational restricted information. It is a pool of the organizational knowledge, which brings people close to each other.

National Institute of Educational Planning and Administration (NIEPA) is a national institute in educational planning and administration in South Asia. An autonomous organization registered under societies Registration Act of 1860, it is fully funded and sponsored by the Government of India. With specialization in policy, planning and management in education, NIEPA is the professional wing of the Government of India. The prime concerns of NIEPA are with capacity building in educational policy, planning and management through research, training, consultancy and dissemination.

NIEPA has identified a number of key approaches that are being pursued to bring qualitative change in the working and services across the organization to achieve the desired goals. In this article, some significant approaches of promoting intranet and sharing knowledge have been discussed which will not only reinforce the intellectuals to share knowledge and expertise among other employees across the organization but also promote the employees to capture, acquire and share knowledge. These approaches to capture, organize and share the information in

electronic environment encourage the academicians to contribute their intellectual works, skills and expertise to enlighten and strengthen the light of learning in the coming generation.

4. SERVICES OFFERED THROUGH INTRANET TECHNOLOGY

With the advent and use of IT, the vary nature of reference service has gone under change. Maximum utilization of the resources does not depend only on good number of books and other resources but their proper management, retrieval and access of information to give maximum benefit and satisfaction to the users are more important and essential. Proper organization of e-reading material in the portals helps the users to locate their desired items without wasting much time. This helps to make easy search and access of document. We put relevant and useful information into the intranet portal on regular intervals. The library provides a variety of learning and teaching environments that involves audiovisual equipment, Internet and access to other digital as well as online resources. The On-line Public Access Catalogue (OPAC), electronic databases and access to intranet provide library users with a wide variety of information resources in a convenient and efficient manner. These services are augmented with traditional as well as modern electronic reference sources and services to strengthen the needs of users. Following services are offered to the users through intranet and WWW:

4.1 List of New Additions

NIEPA Library and Documentation Centre brings out the list of new additions online every month to acquaint the faculty and other users regarding new books, documents, reports and non-book material, etc. added to its collection. The list contains the complete bibliographical information of the books, documents, reports and non-book material with subject index. This service not only save the valuable time of the users to trace out the latest arrivals but also offer opportunity to get their desired document at the right time.

4.2 List of Journals Subscribed and Discontinued

The center generates up-to-date list of journals both Indian and foreign on intranet which are subscribed by the library. It also includes list of those journals that have been dropped or discontinued due to any reason. The list of journals subscribed

and discontinued is also available on intranet and Internet in alphabetical order.

4.3 Current Contents of Periodicals

Current Contents of Periodicals not only save the valuable time of the users but also keeps aware and up-to-date the users regarding latest arrivals of the journals in the library. The Library and Documentation Centre spend about 80% of its budget on the subscription of journals and gets about 250 journals and magazines. To make the effective use of the journals subscribed by the library, the center offers online current contents of periodicals and content alert service to its users. This service helps the users to identify article/writ-up of his or her interest. Current Contents of Periodicals subscribed in the library is available online for those journals whose web sites and online contents are available on Internet. The sites of these journals are hyper linked and users can access this information from their desktops. This service makes the effective use of the journals subscribed by the library.

4.4 Indexing of Journal's Articles

The library has developed an in-house database of about 20,000 articles of the journals both national and international. All articles of the journals being subscribed in the library have been indexed from the beginning. This service is rendered every month by sending the file of indexed latest articles published in the specialized area. Indexing database is available on the Intranet and DELNET (Developing Library Network). Users get benefit from this service for their research and project work through OPAC.

4.5 Bibliographic Service

This service is rendered through in house databases, indexing and DELNET databases on the demand of the area of interest of users.

4.6 Online Public Access Catalogue (OPAC)

OPAC facility has been provided to the library users. The centre has automated all housekeeping operations such as books database, documents database, serials control, journal articles database, non-book material, etc. The OPAC allows user-friendly

searches by author, corporate author, title, keywords, series, publisher and subject. Menu driven screen of the OPAC helps the users to make searches and to retrieve the desired information immediately and in an easy way. All the library system is user-friendly that enhances the utility and effectiveness of the library. All faculty members, participants of training programmes and research scholars can access the library catalogue and other electronic databases from the Library and Documentation Center, computer laboratory and their rooms.

4.7 Inter Library Loan and Document Delivery

Now a days no library can be self-reliant to acquire all material required by its users. To meet all kinds of requirements of the users, the libraries share the resources through inter library loan and by other means. NIEPA Library and Documentation Centre have also got the membership of DELNET. DELNET is a network of more than 772 libraries as its members, including both institutional and associate-institutional of India and abroad. It shares the electronic resources published and unpublished of NIEPA with the intellectuals at global level. Since NIEPA is a non-profit making organization and it strives to meet the needs of its users round-the-clock even in remote areas.

4.8 Resource Sharing

The libraries are facing severe financial constraints and are not in a position to be self-reliant to fulfill the information needs of their users. The DELNET was established to fill the gap in this direction. NIEPA Library and Documentation Centre is a member of DELNET that assists to augment access and share the resources with other libraries. It provides access to the digital resources.

4.9 Online Library

An online library has been developed that provides access to more than 200 full-text Indian and foreign journals in the domain of education, finance, management, information technology and allied disciplines. These journals are available in the NIEPA Library and Documentation Centre's site in classified and alphabetical order. Moreover, other services such as current contents of periodicals subscribed by the library and other documentation services are also available online. Indexing databases such as Social Science Online Journals developed by

the Institute for Studies in Industrial Development (ISID), New Delhi, AGRICOLA (AGRICultural Online Access) and POPLINE (World's Largest Bibliographic Database on Population, Family Planning and Health related issues) are available free of cost on the Internet. Many national and international full text reports can also be accessed through intranet round- the-clock.

4.10 Access to Digital Resources

Digital information is the need of the 21st century libraries and it should be motive of each library to digitize its current and past organizational knowledge or products and huge amount of paper-based information in to electronic format. The libraries of developed countries have already taken initiative in this direction and now developing world is also pursuing the same path to digitize its in house resources. NIEPA Library and Documentation Centre has taken initiative to digitize its current research studies, occasional papers, training programmes reports, books, journals, dissertations and theses to offer round-the-clock access to the users.

Digitization of research studies and other publications and easy access to those resources on Web is an invaluable contribution to the academic and research community. Before digitization it must be ensured that quality of digitized product should meet the national and international standards of printing and publishing. Access of current research studies, occasional paper series, training programme reports and proceedings, etc. have been offered on intranet as well as on Internet. As NIEPA is a non-profit making organization, its motive is to disseminate its published and unpublished resources to the wide spectrum of scholars in the area of education. The institute is making efforts to digitize its old published and unpublished works that currently exists on paper for the preservation and dissemination of knowledge for the future generation.

4.11 Intranet, Extranet and Internet

Organization has lay down emphasize on to develop and strengthen the intranet activities of the organization to handle various types of internal information among employees. Easy access to the information system is important for timely and effective decision making during meetings. Major goal of any information system is to structure the unstructured information scattered in the organizational units in such fashion that can be

easily leveraged and shared in the organization. Further it will assist to the management and decision-making body to make decisions, evaluation of faculty members and observe to what extent the organization has achieved its goals. Faculty members and publication department furnish the books, research works, articles, and proceedings without any hesitation to strengthen the knowledge pool of the organization. Through this the management and decision making body can take decision regarding recruitment of faculty and staff for research, training, group meetings, research technology, education planning and policy and web development. Beside this decision making body takes instant decisions in the area of faculty assessment, students' evaluation, financial stability, infrastructure and growth and development of the organization.

Lot of full-text information has already been made available on the intranet and Internet that includes books, journals and newsletters, research studies, occasional papers, training programmes' reports, Diploma in Educational Planning and Administration (DEPA) and International Diploma in Educational Planning and Administration (IDEPA) dissertations, theses, etc. All kinds of forms used in the organization such as registration form for DEPA, IDEPA and training programmes, claiming refund of medical expenses, requisition of staff car, leave form, list of intercoms and telephone number of NIEPA, medical form, no dues certificate, book order form, photo state form, report for duty and short leave form, etc. are available in portable document format (PDF) on intranet. These forms are updated and reviewed by the administrators and decision makers on intranet before uploading on the Web.

Moreover, other documentation activities have also been generated and updated time to time. Online information about 200 full-text Indian and foreign journals in the area of education, library and information science, economics, management and allied disciplines in alphabetical and classified order, current contents of periodicals subscribed by the library, indexing databases such as Social Science Online Journals developed by the Institute for Studies in Industrial Development (ISID), New Delhi, AGRICOLA (AGRICultural Online Access) and POPLINE (World's Largest Bibliographic Database on Population, Family Planning and Health related issues) which are available free of cost on the Internet have been linked with the intranet to provide easy access. Moreover, many national and international full text reports such as Asian Development Indicators, Asian Development Outlook,

Human Development Report, World Development Indicators and World Development Report, etc. can be accessed by the users at one-stop-pool.

Every organization must emphasize to build a system which could capture all the organization's internal knowledge and integrate the same with useful outside knowledge such as educational news from the Web and e-mail communications with intellectual groups, discussions, talks etc. The main purpose of the intranet is to create one-stop-pool for knowledge rather than having to go to several places for the information you need. The site can also feature other organizational information such as budget information, financial benefits, work-in-progress documents, sale of documents, archived e-mail discussions of internal and external intellectuals, data and manpower directory, etc. Outdated, irrelevant and inaccurate data and information is obsolete from the intranet and Internet on the feedback of the internal as well as online users (Thakur, 2004). Moreover, other information which cannot be uploaded on the Web site is accessible and shared on intranet, e.g. online databases and information about official circulation. Sharing of ideas on intranet radically improve an organization's development and breaks communication barrier across the organization. Indeed, an intranet is one step closer to the paperless office and probably it is a one of the major benefit to the entire organization such as reduce paper expenses, avoid duplicate efforts of the staff, increase the productivity and morale, save the time of the staff and bring closer to each other. Norris et al (2003) states that transact able e-knowledge and knowledge networking will become the lifeblood of knowledge sharing. They will support a "Knowledge Economy" based on creating, distributing and adding value to knowledge, the very activities in which colleges and universities are engaged. Yet few colleges and universities have taken sufficient account of the need to use their knowledge assets to achieve strategic differentiation (Norris, et al, 2003).

To disseminate or access the information beyond the firewall, a password-protected extranet enables the faculty, research scholars and decision makers to share the internal and external pool of information and knowledge with the colleagues all over the world. They can contribute information to the knowledge pool from any part of the world. In an organizational environment, intranet can act as a facilitator in the knowledge managing process by harnessing tacit knowledge on an intra organizational Web.

4.12 Development of Knowledge Management System for Organization

Knowledge Management System (KMS) offers a platform of sharing of ideas, insights and knowledge resides among the intellectuals. Knowledge management system is a process to integrate various databases and processes of the organization in order to bring efficiency, effectiveness, productivity, quality and qualitative change in the working of entire organization. It assists the decision makers, policy makers and administrators in making decisions and strengthens decision support system, document management, communication, and dissemination of information and develops knowledge products. Emphasis has been laid on to develop the KMS to capture knowledge, ideas, and insights among intellectuals and share the same across the organization through intranet. Besides this, it embraces activities of all sections/departments/units such as organization's policy, financial resources, maintenance, salary, medical and other miscellaneous expenses met by the organization. Financial information, publications, document management, knowledgeable products and all kinds of forms used in the organization would also assist the administrators to take quick decisions. Directory of training participants, resource persons, and directory of the Institute's manpower is also in progress which will help the administrators and decision makers to use the skilled personnel in the thrust areas to fulfill the needs of the different units of the organization. This system will familiar the individuals as well as new comers about the policies and work culture of the organization.

4.13 Sharing among Intellectuals

Organization must develop human competencies and nurture innovative culture to share the ideas embedded in the few minds across the organization. In organizations knowledge can be shared effectively through face-to-face conversations around the office coffee machine or teatime. It is a highly effective place where value can be incorporated in the existing knowledge through conversation among intellectuals and discussions on highly and complicated issues. It will help to capture the collective knowledge that ensures organizational continuity and achievement of the organizational goals. No doubt the sharing of knowledge process offers an opportunity to explore the best ways to improve the efficiency, effectiveness and timeliness. Intranet enhances the utility and effectiveness of sharing of ideas between two or more than two users. Through sharing of knowledge

organizations can best foster the capture and exchange of knowledge through communities of practice and make the results available to others to spur innovations. Knowledge is contributed and shared through research papers, technical briefings, identify good practices, product evaluations and reports, faculty and intellectuals make an effort to share experiences, locate people with expertise in their field. All these electronic resources can be shared and better utilized through intranet. Application and use of IT can create a knowledge network and disseminate information in thrust areas. Further to find out the area where more knowledge is needed and use collective approach of wisdom of intellectual assets to create and disseminate new knowledge. Faculty can design the course and interact with the learners and students on the core issues of curriculum design, assessment of students' progress, question/answer resources and interact on the issues of tacit knowledge and other activities through intranet.

4.14 Strengthen Knowledge Repository and its Use

Knowledge repository that covers organizational policies, procedures, meeting agendas, minutes, reports and other important published and unpublished documents for the future use of faculty, researchers and administrators. Electronic products (files) of all kinds of works whether it is published or unpublished are captured from the faculty, intellectuals and project staff to preserve and enable them accessible and share on the networks to others round-the-clock to enhance the utility of the intranet. Its storage and retrieval process is user friendly. 'For the successful implementation of information system on intranet and sharing of knowledge in the organization, the search engine must be created which enable the users to search full-text archived documents rather than relying on key subjects, indexes, abstracts, titles and bibliographical details' (Picket and Hamre, 2002). All organizational policies, procedures and official documents require a very efficient search procedure to retrieve thousands of organizational publications stored on the intranet and extranet environment of the organization. In NIEPA, pioneering efforts are going on to capture the digital assets from the faculty and enable them in shareable objects.

Knowledge repository management presents several challenges for establishing standards for the storage, viewing and retrieval of full-text documents. Web-based search and access of full-text documents stored in the knowledge management pool (database) makes the searches easy and user-friendly. Advent of information

technology and software has improved and brought qualitative change in the storage and use of full-text publications. Web browser help to retrieve and access the documents available in different formats such as Word, Excel, Power Point, PDF (portable document format), HTML (hypertext mark-up language) and others. Users can access these files in different formats, which they require. Most of the documents are available in PDF, which do not take much time to open the document on the desktop. Moreover, keywords of search results and effective search results are key components of document management. Contents of documents stored in the knowledge management database (KMD) should be such where one can quickly and efficiently access and retrieve the desired item. On-line knowledge management repository in any educational organization can make available knowledge sharing through published books, proceedings, reports, policies and unpublished reports, research studies to the research community of the campus as well as extranet users easily and round-the-clock (Thakur, 2004).

4.15 Knowledge Sharing Workspace

Platform of sharing of ideas, insights and knowledge resides among the intellectuals must be developed to nurture, strengthen and regenerate the knowledge. Sharing of knowledge across the organization and its units is significant approach of knowledge management and this can be effectively used through intranet. Web Space collaboration applications are new tools which enhance the communication and knowledge sharing capabilities for intellectual works. Dynamic sharing environment through intranet, an organization can become more productive and responsive by providing access to critical resources. Other collaboration tools such as e-mail, Web conferencing, discussion groups, alerts, workflow and document sharing are essential components of knowledge management, which can be exploited through intranet. These tools offer resource sharing among faculty, researchers and administrators of various units of the organization. This approach assists to preserve, leverage and share the tacit knowledge easily and effectively – both inside and beyond the firewall. Though e-mail works well for sharing of information but Web Space in the organization, offers rich sharing environment to workout the critical issues. It eliminates the geographic boundaries by providing online workplace to the team of faculty, research scholars, planners and intellectuals working in the organization to accomplish the mission together online to

collaborate on policies, procedures, documents, issues, discussions, complicated tasks, evaluations and assessments.

4.16 Decision Support System

The development of an effective decision support system is a primary objective of the organization and it can be successfully implemented in the organization through intranet network. Major goal of any organization is to structure and organize and retrieve the information that assist to the management and decision making body to make decisions and evaluation of faculty members. This responsibility of decision support system should be undertaken by the IT experts by collecting research, planning, teaching information from the all departments of academic and research organization. This team should fix the responsibility to train the faculty, administrators and management to access and use the tools and information to make effective functioning of their roles in the organization. It needs to strengthen and give responsibility to the department to develop such network system according to their working activities so that research studies, data analysis and other information tools could be utilized in pursuit of excellence. It will improve the research activities of the organization and bring the qualitative change in the access, use and consultation services.

4.17 Forms or Content Communication

To make effective use of the organization's time and money, all forms presented on the intranet site such as admission forms, registration forms for conferences, training programmes, seminar and workshop, etc. should be in electronic form. Besides it, other forms of daily uses can also be stored on the intranet. Today most of the organizations have deployed Web technologies to present their most of the forms in electronic form to the internal and external community of the organization. Of course it is a labour-intensive and time consuming process but offers one time input and several times output. The team of knowledge workers and practitioners must devote their valuable time to redesign the structure of electronic forms. Structure of content communication and electronic forms should be framed in simple and easy that can be easily used. Institutions follow the Web technology to present electronic forms to the user community of the organization and save much time and labour intensive approach of the individual. Another benefit to the organization is these forms can be simultaneously reviewed and approved by the multiple

practitioners. Moreover, the procedure of capturing and storing of official documents and e-forms safe the organization from the attrition, downsizing, transfer and loss of key personnel who are expertise and maintain that knowledge of procedures with them. In addition, rules, procedures, practices, regulations and e-forms can be edited, revised and re-examined whenever the organization desires. Intranet technology offers opportunity to integrate (different processes) strategies, electronic forms, work processes and other through the implementation of technology. For example, a faculty member can receive list of participants, students, submit test grades, initiate requisitions, and conduct library searches and other activities.

5. FUTURE OF ELECTRONIC RESOURCES AND WEB ENABLED SERVICES

The financial constraints of the organizations and libraries are a universal problem. Not only developing countries but developed ones as well are not immune to this problem. The gradual fall in the annual budgets of the organization and libraries is universal that hinders the development of the research work of the organization. E-resources, which are cheap in comparison to the printed resources, are a solution to all problems. Online resources have replaced the printed resources such as books, journals, reference sources and reports, etc. The significant factors are the possibilities of rapid publication, rapid updating and economics of electronic distribution. It is a fact that electronic resources can be published frequently and updated whenever needed. The various kinds of important reference sources like statistical data, business information, encyclopedias, dictionaries, directories, compilation of data and books of facts are produced in electronic because electronic technology can search and sort large data quickly in a different manners. Encyclopedia Britannica has gained more popularity and earned more income from web-based electronic version than from print publication. In addition, indexing and abstracting journals are also important reference sources, which are being publishing electronically. A major advantage of online resources is that electronic information in journals, books and proceedings, etc. can be accessed any time and every place throughout the world. Such types of information are more suited in electronic format than others. Libraries are focusing their attention towards the acquisition of e-resources such as journals, indexing and abstracting databases, encyclopedias, directories, etc. to offer multiple accesses to the students, academic and research community.

Internet is not only the source of providing information but it has offered so many opportunities of publishing, establishing networks, web conferencing, interactive services and broad casting. The report of the results of a survey of technology predictions at colleges and universities, published in the issue of Campus Trends (American Council on Education) indicated that 68 percent of the colleges and universities feel more courses using electronic materials in the coming year, 47 percent foresee more courses offered through distance learning, and 34 percent see more assignments submitted electronically (Hitchingham, 1996). Such electronic trends have revolutionized the world of scholars to conduct programmes and amalgamate the electronic publications and use of other information technologies in teaching and distance learning. In the support of electronic documents, Ward (1998) stated that the value of electronic documents and information is proliferating by leaps and bounds. According to the Electronic Document Systems Foundation (EDSF), the worldwide value of electronic document revenue in 1991 stood at $46.9bn; by 1996 this had grown to $85.7bn. The value of electronic documents is doubling every five years and it will reach at $600bn by 2010 (Ward, 1996).

Mashelkar (2000) indicates that tomorrow's society will be a knowledge based society and every one should have access to knowledge so that a knowledgeable worker could generate the national wealth and being prosperity for the nation. In today's electronic environment, the wealth of a nation is measured in terms of knowledge-based society and not by the physical assets like land, buildings, etc. He has further stated that economics of knowledge would dominate the 21st century. It is the need of the hour that preservation of knowledge should not be documented but also digitized so that this digitized information could be exploited by the chain of research organizations. Digitized information or electronic information can be preserved for a longer period of time. Developed countries like USA and the UK have already launched operations to preserve information for future in electronic format. He further stated that the market for knowledge society will be knowledge markets and its wars will be fought not by conventional weapons, guns and missiles but in the knowledge markets with the new thermonuclear weapons which is called 'information and knowledge'. These weapons can be used if we take the initiative to change with the new technology. The libraries are gradually moving in this direction and some of the libraries have already taken initiatives to digitize its resources and have been subscribing e-journals' databases to provide round the clock

access to their users. E-publications have brought a solution to the libraries and organizations, which have the space problem in today's metropolitan cities and industrialized society.

It is impossible to predict the future of online resources but it is a fact that it largely depends upon the speed of transition of information. An advanced technology and systems are required to adopt the change in our traditional systems but it is only possible if we accept the electronic publications as compared to printed publications. But it is fact that financial constraints and lack of infrastructure in electronic environment have affected the Research and Development (R&D) in academic as well as research organizations of Third World Countries. Our library systems need change in their traditional setups, because old collections of printed resources whether it is journal or a monograph need to be preserved and converted in to digital format.

6. CONCLUSION

The library is a nerve centre of any academic and research institution. Information available in one society may be vital to another and this factor ensures wide and effective communication and mode of transition of information. This can be achieved if library capture and procure electronic resources and make their accessibility through intranet in place of traditional printed resources. Intranet plays a central role in the academic organization to expand the utility of knowledge to the wider community of researchers. Emergence of Internet and intranet technology has posed some exciting challenges and opportunities to explore the ways of exploiting resources and benefit the users through the transfer of quick information. Many government and non-governmental organizations have initiated their efforts towards the digitization and have launched their digital products free of cost on the Internet so that right information at the right time to the needy users can be accessed and disseminated. Yesterday's backward nations were those, which missed out on industrial revolution, and tomorrow's backward nations would be those, which would miss out on Information and Communication Technology (ICT) and application of intranet and Internet technology to access electronic information. With this changing environment, if the libraries of contemporary world do not change themselves it will ultimately become increasingly uncompetitive and will go out of the race of information world. The suggestions given above will further improve the library services and cultivate

the culture to access, use, share and generate online resources and services through intranet in the organization.

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PENICILLINS FOR COMPUTERS: A PRACTICAL APPROACH AGAINST VIRUSES FOR LIBRARY AND INFORMATION CENTRES

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ABSTRACT

The paper introduced virus and its various types such as Boot sector, File multipartite, Polymorphic, Stealth and Macros given common ways of infection and who boot polymorphic viruses infect also, are shown diagrammatically. Give a list of few important viruses up to 2004. Few approaches to detect viruses and ways to remove infected files are given. Many anti viruses have been discussed. Updation through Internet for McAfee is also given. Suggest for use of licensed anti virus and precautions to be taken in using e-mail etc.

1. VIRUS

Virus is a type of software that infects a computer. It is typically inserted into a program and when that program is executed, the virus activates and attaches itself to other programs in the PC. Viruses can be a simple prank—an annoying pop-up message or blue screen. But too often a virus is a malicious attempt to outright destroy data and programs.

There are several different types of viruses, but they all have a common thread. Viruses aren't actually attached to data. They must be run in some form to infect a PC or its data. Viruses also commonly come in the form of Web downloads and e-mail attachments. Viruses can infect and destroy immediately, or launch on a specified date. They can affect single desktops, or spread to entire networks, servers and Web sites. While many viruses are simply pranks or annoyances, others are more complex and their effects can be devastating. Viruses can obliterate data, corrupt programs so that they no longer run, stall servers with e-mail bombs, replace files, steal passwords and infect address books as it propagates itself. In the past, the most common way to spread a virus was through a floppy disk. But today, hackers and virus villains have a much more powerful and easier means of infecting PCs: the Internet.

2. TYPES OF VIRUS

Broadly viruses are classified into following categories:

2.1 Boot Sector

Over 85 percent of all viruses are boot sector viruses. These are fairly easy to create. They infect the computer on relatively low level. Some virus spring into action only when boot-up computer with an infected floppy disk. Others infect machine when first accessed an infected floppy disk in the disk drive.

2.2 File

These viruses are actually viruses in disguise. When the files are opened it executes the instructions and attacks a program. Some such viruses replicate themselves while others destroy the program being used. After removing a file virus you will probably have to reinstall damaged applications of files.

2.3 Multipartite

Multipartite viruses are a cross between file and boot sector viruses and infect both files and boot sectors. They are more infectious and comparatively more difficult to remove.

2.4 Polymorphic

A polymerphic virus mutates, creating a new string of viral code called a signature, each time it infects or spreads. These viruses are designed to avoid detection by anti-virus programs, which look for specific viral signatures.

2.5 Stealth

As the name implies, these viruses try to hide themselves. Sometimes they remove themselves from memory temporarily to avoid detection. Another technique is to conceal the increase in length of an infected file and display the original length, to fool scanners into believing that the file is unchanged in terms of file size and length.

2.6 Macros

A macro virus is a file containing a viral macro command set. Macro viruses spread quickly, and some have random activation, giving the user variable chances for activation of the macro. Also, macro viruses are not platform specific- they infect both PC and Macintosh operating systems.

3. COMMON WAYS VIRUSES ENTER THE SYSTEM

There are few common ways in which viruses enter computer.

(i) Unsafe attachments in e-mail messages are opened;
(ii) When preview page in e-mail client in opened;
(iii) A Web page that contains malicious code is opened;
(iv) Virus-infected file over a P2P network is sent; and
(v) An infected file from removable media such as a floppy disk or CD in run.

4. STRIKE OF VIRUSES

This section discusses process of infection few of types of viruses.

4.1 Boot Viruses

(i) The user unsuspectingly copies a virus infected file on floppy disk or hard disk,
(ii) When the infected file is executed it is loaded with the virus into RAM,
(iii) The virus copies the boot record program to another sector. Then the virus makes a copy of itself in the disk boot sector. The next time the computer boots from the disk, the virus in the boot sector loads itself into RAM, makes copies of it and then infects other files on disk.

4.2 Polymorphic Virus

(i) The user copies an infected file to disk,
(ii) When the infected file is executed it is loaded with the virus into RAM,
(iii) The new virus then looks for a host, infecting other files on disk,

(iv) The virus makes copies of itself in RAM,
(v) The mutation engine on the new viruses generations unique encryption routines that encrypt the virus body and mutation engine.

5. Important Viruses

There are approximately 14000-18000 viruses at present, which are increasing every month. They are getting more and more complicated In September and October, alone 20 more viruses have been detected which are presented in Table-1.

Table-1 List of important Viruses

S. No.	Month	Latest Virus Alerts
1.	13 Oct	W32/Bagz-B
2.	13 Oct	W32/Sdbot-QF
3.	13 Oct	W32/Apribot-C
4.	12 Oct	W32/Funner-A
5.	12 Oct	W32/Snoop-A
6.	12 Oct	W32/Forbot-BD
7.	12 Oct	W32/Forbot-AZ
8.	12 Oct	W32/Bagle-AC
9.	11 Oct	W32/Rbot-MI
10	11 Oct	W32/Forbot-BA

S. No.	Month	Virus Alerts
1.	Sept.	W32/Zafi-B
2.	Sept.	W32/Netsky-P
3.	Sept.	W32/Netsky-D
4.	Sept.	W32/Netsky-Z
5.	Sept.	W32/Bagle-AA
6.	Sept.	W32/MyDoom-O
7.	Sept.	W32/Netsky-B
8.	Sept.	W32/Netsky-Q
9.	Sept.	W32/Lovgate-V
10	Sept.	W32/Netsky-C

6. Anti-Virus or Pencillins

Malicious code is the biggest worry in every security administrator's mind today, and most of it comes in through email as attachments. A part of it can also come through the web, if downloading software. Unfortunately, the sad part is that despite all the development, most anti-virus technology is still unable to provide protection from unknown viruses. The companies incur major financial losses every year due to virus or worm attacks. The sadder part is that despite all this, most companies still don't keep their anti-virus software updated. Perhaps even the update technology needs a further push to make life easier for system administrators.

6.1 Approaches to detect the viruses

The viruses are detected by anti viruses by three approaches:

(i) The Signature approach

Just like the police trace patterns in crimes back to a criminal, software engineers can reverse engineer a virus to find the signature it leaves. This signature is added to the database, so, when Buster performs a virus scan, each file is scanned for matches with any virus' signature.

(ii) The sandbox approach

A 'Sandbox' is an advanced program that emulates an Operating System. A suspect executable file is run within the confines of a sandbox, and then the sandbox is examined to see what changes were made. These changes are used to determine which virus infected the file.

(iii) The Heuristic approach

This analyses a program for 'seemingly' malicious behaviour. Heuristics is effective against undocumented viruses.

6.2 Ways an anti-virus software removes infected files

There are five ways by which virus are removed by the anti viruses.

(i) Removal of virus code

Removing the viral code from the file, if possible. This is the best case scenario and no harm is done to the system.

(ii) Quarantine of the infected file

Buster tries to make the file inaccessible to programs, without deleting it.

(iii) Deleting the infected file

Buster deletes the file if the code cannot be removed, or the file quarantined.

(iv) Physical removal of Infected file

If the file is in use by the OS, a user needs to manually delete it (if it is a non-critical file), or manually replace it from a clean backup.

(v) **Seeking help**

Viruses often make changes to the registry, and user can't always reverse these changes. In such cases, users are directed to the company's Web site, for help on what registry keys to change or delete. If these five methods fail, or if a critical operating system file is infected, Buster books via a secondary O.S. to access files being used by the infected O.S.

6.3 Common Anti viruses or Penicillins

These are following common anti viruses in use:

(i) **F-Secure AntiVirus (Data Fellows)**

It is a real-time and on-demand virus scanning and protection system for Windows platforms. It can be upgraded to a multi-layered virus protection system performing multiple simultaneous scans with multiple scanning engines, including on-demand and real-time scans. It combines multiple virus scanning engines into a single framework by using both the F-PROT and AVP anti-virus engines simultaneously.

(ii) **InoculateIT (Computer Associates)**

It is antivirus solution for networked environments. The features include Real-Time Cure, Universal Manager, Virus Wall, Virus Quarantine, Hands-Free Updates, Extensive Alerting Options, Internet Web Browser Integration and Messaging Protection. It is Certified by the International Computer Security Association (ICSA) to detect 100% of viruses "in the wild."

(iii) **InterScan VirusWall (Trend Micro)**

It provides high-performance three-in-one Internet gateway protection against viruses and malicious code. The optional eManager adds Spam blocking, content filtering, and email scheduling. It in real-time virus detection and clean-up for all SMTP, HTTP and FTP Internet traffic at the gateway. It is compatible with FireWall-1 and most major firewalls. It has automatic virus pattern file updates. It configures locally via Windows interface or remotely using a web browser. It supports check Point Software Technologies' CVP standard (Solaris and Windows NT, Intel). It optionally blocks malicious mobile code (Java and ActiveX) at the gateway. Supports direct integration with

Lucent's Managed Firewall using Trend and Lucent's jointly developed content scanning protocol.

(iv) **NetShield for Netware (McAfee)**
It provides virus and malicious code protection at the NetWare server level. It certified and approved by Novell NetShield for NetWare is especially designed to protect the more than 4 million NetWare servers around the world. It helps prevent macro viruses, polymorphic viruses and all other major virus threats as well as Internet worms, Web attacks and infected emails. As part of the McAfee Total Virus Defense suite, NetShield for NetWare is backed by AVERT and the full spectrum of Network Associates security services.

(v) **NetShield NT (McAfee)**
It scans server files for all types of viruses. Automates server virus defense with centralized alerting, reporting, & cross-platform NT/NetWare management tools. It stops virus proliferation with automated quarantine process. It saves admin time with remote installation & configuration from any workstation or server. It includes automated security update options. It minimizes scan time with scan exception list. It sweeps all server files immediately with on-demand scanner. It interoperates with other management & security tools.

(vi) **Norman Virus Control (Norman Data Defense Systems)**
It runs on OS/2, DOS, Windows 3.1x, Windows 95/98, Windows NT and Novell NetWare. NVC for Groupware is available for Lotus Domino and MS Exchange. Regardless of platform, NVC has the following features: Uses the same search engine and virus definition files, Unified search results and easier updating of the systems with a mutual definition file. It may clean viruses in all operating systems directly from the graphical application. NVC also identify and clean unknown viruses based on heuristics. NVC can also detect new and mutated versions of viruses. NVC supports Office97, Microsoft's new macro language VBA5. IPX and SNMP messaging system is fully supported. NVC can also send SNMP "traps" to dedicated stations in the network. It is also possible to send IPX messages to Novell server, provided NVC for Netware (Fire Break) is installed.

(vii) **Norton AntiVirus (Symantec)**

It offerings include Norton AntiVirus Enterprise Solution 4.0, Norton AntiVirus 7.0 Corporate Edition, Norton AntiVirus 7.0 Corporate Edition for NetWare, Norton AntiVirus 2.0 for Lotus Notes, Norton AntiVirus 2.0 for Microsoft Exchange, Norton AntiVirus 5.0 for OS/2, Norton AntiVirus 4.0 for NetWare, Norton AntiVirus 1.5 for Firewalls, Norton AntiVirus 2.0 for Gateways, Norton AntiVirus Plus for Tivoli Enterprise and IT Director, Norton AntiVirus Management Console. Norton AntiVirus Macintosh version is also available.

(viii) **PC-cillin (Trend Micro)**

It chat on-line with Trend Virus Doctors who can give advice and support, free. It scans Wizard. Scan Managers. Quarantine Area. WebTrap. CyberClinic. PC-Cillin 6.0 It is simple interface and basic functionality, is one of the more popular anti-virus packages in the market. It is developed by Trend Micro, the latest version of PC-cillin comes on a CD-ROM or six floppies with one Emergency DOS disk.Files that cannot be disinfected by PC-cillin are incarcerated in the quarantine area so that they cannot spread the infection. From here they can be transported to the Virus Hospital on Trend Micro's Web site.

It also has files option, which enables parents to restrict their children from viewing Web sites with objectionable contents.

(ix) **Sophos Anti-Virus (Sophos)**

It offerings include Sophos Anti-Virus for Windows NT, Sophos Anti-Virus for Windows 95/98, Sophos Anti-Virus for DOS/Windows 3.x, Sophos Anti-Virus for Macintosh, Sophos Anti-Virus for Unix, Sophos Anti-Virus for OS/2, Sophos Anti-Virus for NetWare, Sophos Anti-Virus for OpenVMS. It monitors all virus entry points, including disks, programs, documents, network drives, CD-ROMs, Internet downloads, email attachments and compressed files. Sophos Anti-virus for Windows 95 is for advanced users. Those with heterogeneous environments will appreciate Sophos Anti-Virus. Taking up just 3 MB on the hard disk, this shareware application works across multiple platforms.

Sophos Anti-Virus lacks in the area of updated virus signature files – updates are not available as and when a

new virus attacks and a cure is discovered. Instead of virus definition files, Sophos provides monthly program updates.

(x) **TVD Management Tools (McAfee)**
It allows centralized control over the VirusScan and NetShield product line. It installs, configures, upgrades, and removes anti-virus software across enterprise networks scaling to any size. It enables centralized upgrading of the network's anti-virus software. It detects attacks and offers alerting via a variety of channels including pager, e-mail, SNMP message, and DMI alert. It includes SecureCast, a free optional Internet service that automatically delivers new upgrades, updates, and security news bulletins the moment they are released from Network Associates. The administrator is notified when an update has been downloaded and is available for deployment.

(xi) **Virex (McAfee)**
It is macintosh anti-virus software. The one click turns it on and off - no locating folders, files, etc. It scan-At-Download will scan Zip archives, as well as files compressed by StuffIt Deluxe, Compact Pro and more. It catches viruses hidden in e-mail attachments. If an infected file is down loaded Virex will alert and quickly repair the file without launching other applications. It protects against macro viruses. It automatically scans files downloaded from the Internet. It also scans compressed files, including Zip archives. Easy-to-access Control Strip module, DropScan and Virex Contextual Menu Plug-in.

(xii) **VirusNet LAN (Safetynet)**
From a central console, the administrator designs an antivirus policy. The VirusNet distribution agent then ensures that this policy is installed and enforced on all workstations. Options include a daily hard drive scan for workstations during bootup, a memory scan during network login to prevent infected workstations from logging in, and background scans from Windows. Infected PCs can be immediately logged off from the network. The LAN anti-virus solution for the Air Force Desktop V contract. It installs and maintains virus protection for an entire network. It supports all major networks including Netware, NT Advanced Server and Warp Server. It includes the complete LAN Scheduler & Distribution system. It automates anti-virus protection for tens or hundreds of

workstations. It prevents infected workstations from logging into the network. Install and forget. It pre configured to provide optimal protection. It performs virus scans during bootup, network login and/or Windows startup. Automatic distribution of updates to each workstation is done. It maintains workstation settings during each network login. It prevents users from removing or disabling virus protection. This central audit trails tracks installation and update information.

(xiii) **VirusNet PC (Safetynet)**
It is resident monitor - Silently protects against Internet, diskette and file-based viruses through the use of a powerful real-time VXD monitor. The infected programs and documents can be disinfected as they are accessed. It detects new viruses including Word Macro viruses. Detects Java, stealth, polymorphic and mutation engine viruses. It also detects file and boot sector viruses. The heuristic and checksum scanners detect unknown viruses. It has full-featured Windows and DOS interfaces. It supports Windows NT, Windows 98, Windows 95, Windows 3.x and DOS.

(xvi) **VirusScan (McAfee)**
It is Checkmark Level 2 Certified. It provides E-Mail and Internet Threat Protection. Java, ActiveX Internet Code Defense. It is configurable desktop-level defense for both Java and ActiveX malicious code. It has auto Update pulls, Enterprise Secure Cast Web pushes, and Management Edition for on-going security. It has interoperability with Multi-Tier Defense.

(xv) **WebShield Model 100 (McAfee)**
It is dedicated Anti-virus Appliance. Features McAfee anti-virus and content scanning technology that uses an array of scanning features to keep the systems free from viruses and other malicious codes. It detects 100% of viruses including boot sector, file, multipartite, stealth, polymorphic, encrypted and macro viruses.

7. UPDATING ANTI VIRUS

New viruses are infecting the system. Hence there is continuous cat & rat war in this field. The anti Virus companies are trying hard to give full protection against beigest threat in IT causing loss of

huge amount. On the other hand notorious elements are posing newer challenges to these industries. The Anti viruses companies have to make their dosage update for newly emerging viruses. In this section we have studied updating anti viruses by McAfee, Norton, AVG can also be updated thorough Internet.

8. CONCLUSION

Viruses are sons of devil's mind. These viruses can cripple computers in minutes. Constant defense for attacks are constantly required. Since new enemies with a new powers are born every day, new defense mechanism are required every moment. Since the Library and Information centers are center of research activities by many uncontrolled users, these centers are likely to have more attacks and are more prone to file damages and system failures. The Library & information Centers do not have highly qualified staff in networking so the problem some time may be more serious. The Librarians and Information managers have to be more cautions. Do not panic whenever there is a virus attack. Try to identify the virus and remove with the help of anti viruses. Use only licensed anti viruses with free update facilities. If virus has come from e-mail immediately delete it and disconnect network.

If an anti virus is unable to remove the viruses take help the Internet and fix for the viruses. At last alternative copy the data to an alternative partition for another hard disk, format the hard disk and reload the operating system and latest version of anti viruses. Never open email attachment from stranger and always use an email filter. An entry-level firewall appliance with the added advantages of built in anti viruses may be very helpful though it may cost little more in a small LAN. Always take help from an anti viruses' specialist from the parent institution as and when required. Training an employee of the library and information center is anti virus software can be an added value to the center.

RADIO FREQUENCY IDENTIFICATION IN LIBRARIES: PROSPECTS AND RETROSPECT

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ABSTRACT

Radio Frequency Identification (RFID) use radio waves to automatically identify individual items and it can be used anywhere that needed a unique identification. It is an emerging, more effective, convenient, and cost efficient technology in library automation and security. Several libraries around the world, especially in America, Canada, and Singapore are using this technology for library functions. By using this technology library staff can enjoy rapid charging and discharging of library materials, and electronic inventorying. They can relieve from repetitive and clerical tasks. Library users can enjoy self-charging and discharging of documents. RFID provides improved security in libraries. It has an advanced security component that may alert library staff when documents are removed from the library without authorization. It is very useful for shelf rectification and stock verification and does not require a line of sight contact. Recent developments in hardware and software have boosted the potential of this technology in library automation and security. This paper explores RFID, why it is useful in libraries; it's major components, advantages and disadvantages in libraries.

1. INTRODUCTION

Radio Frequency Identification is a form of automatic identification and data capture technology. It has a combination of radio frequency and microchip technology. It stores and retrieves data from computer chips using radio frequency transmission. It does not require line of sight contact and it can be used anywhere that needed a unique identification. It is an emerging, more effective, convenient, and cost efficient technology in library automation and security. It has been around libraries for more than two decades. Libraries began using this technology in the late 1990s (Kern, 2004). Several libraries around the world, especially in U.S, Canada, and Singapore are using this technology for library functions.

RFID stands for Radio Frequency Identification use radio waves to uniquely identify an object by transmitting a stored code from a chip to a reader (Jones, 2004). It is using an alternative to the barcode technology and it can identify several objects at the same time.

Libraries can use it to meet various library operations like charging and discharging of documents, stock verification, shelf rectification, etc. It can facilitate the tracking of books within the library. It provides improved security in libraries. It has an advanced security component that may alert library staff when documents are removed from the library without authorization. It can improve circulation and inventory controls.

2. COMPONENTS OF RFID

The RFID system consists of three basic components, RFID tags, Readers or Sensors, and Server (Mehta, 2004).

2.1 Tags

RFID tags consist of an antenna and an integrated circuit. Tags can be active, passive or semi-active and coming in a variety of shapes and sizes. It can be attached to various objects. Active tags contain their own power source and are comparatively larger and more expensive than the passive tags. Passive tags get power on the radio signal sent by the readers. They are comparatively cheaper than the active tags and a library can use passive tags. Some tags have security bits.

2.2 Readers

RFID readers are used to detect and read information contained in the tags. It is composed of a radio frequency module, a control unit and an antenna. It powers antenna to generate a radio frequency field. When a tag passes through the field, the information stored in the tag is decoded by the reader and sent to the server. Readers can be portable using hand held devices or it can be placed in different locations to read the tags within the interrogation zone. Library can use different types of readers in different places like in the circulation counter for charging and discharging of library documents, in the self charging stations and book-drops to charge and discharge library documents for users, in the exit of the library to read the status of library material whether it is charged or discharged and in the portable devices used for shelf rectification and stock verification.

2.3 Server

The server acts as a communication gateway among the various components of an RFID system. It has software like application programming interface and transaction database. It receives data from the RFID readers and exchange data with the application programmes (Indira, 2004).

3. ADVANTAGES OF RFID

RFID technology has many advantages. As far as a library or information center is concerned it will increase the speed of charging and discharging of documents, RFID tags can detect and read much faster and it can read several documents at the same time. Library users can charge several documents simultaneously using special self-charging stations and return documents in the special boxes or book-drops making circulation faster and easier. Library staff can relive from repetitive and clerical tasks and they can concentrate on more demanding personalized information services. RFID can sort documents automatically and library staff can shelve documents very easily. Library staff can use portable hand held readers for electronic inventorying by passing them rapidly along the shelves to read all the documents. There is no need of handling each document individually. They can report the lost, hidden or unordered documents more easily using these portable readers.

RFID tags have greater storage capacity and can hold large amount of information about a document. Its microchips are read/write with update flexibility. It can be used for status control as well as for security checks. It can be placed anywhere in the documents since it does not need a line of sight contact. For example it can be placed inside the documents and this will provide protection to the tags from damage or destruction during rough handling of documents. The tags can stand up in harsh environments. Several tags can read simultaneously even through the hard document covers.

Security is a major concern in an electronic environment. RFID will provide improved security without staff intervention. Its tags have an advanced security bit and it will detect uncharged documents while passing through the security gate. The tags have an interface between the readers in the exit and the circulation system to detect and identify items moving through the exit. The same tag can be used for detecting materials and also for security.

4. DISADVANTAGES OF RFID

RFID technology has few drawbacks. As far as the libraries in developing country like India is concerned, cost is a major concern. For implementing and maintaining RFID system, a substantial amount is needed. It may cost around $50,000 for a library with 40,000 documents. A comprehensive RFID system for 100,000 documents with self-charging station, book-drop unit and automatic book sorting system ranges from $100,000 to $200,000 (Indira, 2004). But recent advancements in hardware and software have boosted the potential of this technology and shortly libraries are going to implement RFID technology for their functions.

Another drawback is that the radio waves cannot pass through metal and liquid at certain frequencies. But this is not a major drawback, that RFID is far better than the barcode technology. Lack of standard is another disadvantage of RFID. This may be due to the limited use of RFID technology. A uniform standard is necessary to bring interoperability to libraries using RFID. This condition may change and RFID readers can read any tags. It is also possible to compromise an RFID system by placing two items against one another to cancel out the signals.

5. CONCLUSION

RFID technology is an emerging, more effective, convenient, and cost efficient technology in library automation and security. It will change the electronic environment of libraries. It will provide improved speed and ease of use in document handling. It will increase the productivity and library staff can concentrate on more productive and personalized information services. Library professionals should try to develop a common standard for RFID for its successful use.

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ROLE, IMPLEMENTATION AND IMPACT OF INTRANETS IN LIBRARY AND INFORMATION CENTRES

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ABSTRACT

The paper deals with Intranet based library and information services. The paper describes how Intranet is influenced in libraries, it's role, impact of intranet, planning, security, implementation, structure, installation and managing of the Intranet and Intranet based library services.

1. INTRODUCTION

Many libraries have gone to develop closed and private internal versions of the Internet called Intranets. These Intranets provide information services within organizations – across a global community in the case of major organizations. The presence of the Internet has unquestionably and permanently altered the library environment. It has dramatically altered how libraries interact with one another, how people who manage and use these institutions conduct their business, and how information of all types is managed. The Internet's dominance in electronic communication has arrived in full force and its influence on the operation of libraries has presented the field with an important question: what is next?

Intranets are internal versions of the Internet. They are a form of private; secure electronic networks that function almost exactly as their larger antecedent. Intranets can use the Internet to connect remote libraries within an organization, but they can also be strictly internal and run completely on a Local Area Network. The objective here is to assist those librarians who find themselves in the position of not only managing the organization of information and its retrieval, but also in the planning, developing and implementing Intranets in library environments so that information retrieval is effective and efficient. A brief examination of Intranet

philosophy and structure will provide a foundation for further discussion on Intranet installation, infrastructure, publishing, and security. There will also be an emphasis on the technical aspects of Intranet architecture and management. It has become apparent to many librarians that Intranets are an essential tool, not only for its internal users, but also as a means for justifying the profession's existence within any library, especially corporate.

2. INFLUENCE OF INTRANETS IN LIBRARIES

Libraries are organizations that conduct business like any other institution. There are administrative functions, acquisitions and purchasing transactions, human resource management issues, public service issues, and the training of staff. Those who implement them only limit the list of possibilities. An Intranet is a medium for delivering information to all employees within the organization. Internal web sites allow managers the ability to communicate in an effective and timely manner with their employees. With this easy dissemination of information there is a better expression of future goals, strategies, and vision to the staff.

3. IMPLEMENTING INTRANET IN LIBRARIES

The idea of an Intranet is a "technology that permits your organization to define itself as a whole entity, a group, a family, where everyone knows their role, and everyone is working on the improvement and health of the organization". The focus on the organizational definition is useful to libraries. If there is a collective will that needs to be communicated to all employees the strategic objectives become easier to achieve. Information and knowledge management become easier job within an organization.

The corporate Intranet provides a tremendous opportunity for librarians to deliver comprehensive information services. It is now practical to extend enterprise-wide desktop access to the library collections as well as to corporate knowledge as recorded in business-critical documents such as policies and procedures, competitive intelligence, research reports, and quality documentation.

The size of an organization also has much to do with the implementation of an Intranet. Many large corporate libraries and academic libraries use an Intranet to facilitate better information services. The sheer size of some corporations spans borders and

have populations in excess of 75,000 employees. Dissemination of information in this kind of environment is truly enormous for the corporate librarian. Achieving the goal of access to all users in these examples demands a strong reasoning for implementation.

Many corporations, because of their global nature, require a global approach information management. Organizations also demand local content development. The means to spreading the local endeavor requires some communication medium and the Intranet is one such tool.

A number of organizations use the Internet to integrate document management and full-text retrieval technology with traditional services and principles of library management to improve productivity and reduce costs. Just as corporations use the Intranet to facilitate better communication and functionality libraries also use Intranets to reduce overlapping of processes and increase efficiency in their objectives.

New incident reports are retrieved into an editing form that allows us to change the item's status to "open", assign it to a particular technician, document the resolution of the problem and fill out statistical information about how long the problem was "open" and how much time was spent working on it. When the incident report is completed, its status is changed to "closed" and it remains in the database.

Any recurring problems would then be logged and a technician would submit a technical note that would explain the problem and its solution; an Intranet FAQ for systems problems. In this case the Helpdesk Web site not only provided "knowledge base" and "incident report" databases, it also included a directory of library staff, emergency contact information for technical support, information about the role of technology in the library's strategic plan and information about ongoing technology related projects. Thus, the role of an Intranet within an organization, whether it be private or public, is to not only manage the library more efficiently, but also to better facilitate the functions of the library.

Libraries are in the business of providing information in all its various formats. Intranets facilitate this function of location and retrieval by making it available electronically and if unavailable electronically, then speeding up the process of Inter Library Loan or Document Delivery. However, the ease in which an Intranet is created and the power it enables organizations to easily and

inexpensively share information there is a price, and that price is the problem of organizing the information so that its intended audience can benefit. "The challenge of the Intranet for librarians is the opportunity to continue to do what we've always done – take a leadership role in the management of information in the new age".

Intranets represent a new platform for remaking some of the core functions of libraries; including acquisitions and processing, cataloguing, inventory control, public relations communication, and public service. If an Intranet was fully exploited within a library a transformation would take place in the organizational structure of the library itself; the library's hierarchy would tend to be flatter; a constant dynamic structure would be evident; and the recognition of the library's intellect and knowledge base amongst it employees would be seen. An issue of special interest to those who work in the corporate environment is the inclusion of the librarian in the design, delivery, and management of the Intranet.

4. INTRANET

An Intranet is the internal network that uses the Internet standards of HTML, HTTP and TCP/IP communications protocol along with a geographical web browse to support various applications and provide departmental, interdepartmental, and countrywide communication solutions. Intranet is a network of networks which lets the use of the technology of the Internet with in an organization while the Internet connects the users all over the world, the Intranet is specifically meant for a particular organization wherein the information related to the organization is made available in an interactive manner for the exclusive use of their staff. For this purpose one centralized server is placed and all the clients can access the server, can have any information they need and can utilize the facilities available in the Intranet.

An Intranet can do a lot for any organization. In fact, the potentials for an Intranet is limited only by the imaginations of the people in the organization who build, grow, and use it. From a broad perspective, though, everything an Intranet to be explained under two simple categories: The Intranet allows employees to use information technology they are using in their daily lives, and it provides all the benefits of any new technology.

(i) An Intranet can bring into an organization the same kinds of communication and information systems that employees use

daily outside of their jobs. That is, the Intranet can accommodate the expectations people increasingly have about how they get and use information.

(ii) An Intranet can do what any technology can do to solve problems, improve processes, and open the door to new possibilities that the technology enables.

5. LIBRARY INTRANET

Library Intranet is a combination of two technologies: The first is an area network — one that is confined to a library or libraries versus the whole world. The second is the ease of use found in the Internet and predominately in the World Wide Web. A few years ago, the Library Internet, which had been in existence for decades, came to the forefront of many minds. Suddenly, the number of library users on it exponentially doubled every few month. Coupled with this came the invention of graphical browsers — front ends that allowed a library user to avoid the command line and easily find what they sought by following a graphical route. Links lead a user from one location, or set of information, to another in an easy to follow pattern.

6. INTRANET vs INTERNET

Any definitions of Intranet begin with the necessity of Internet. The Internet is that network of networks, which connects people and computers worldwide. Most users' contact points for the Internet are E-mail and World Wide Web. While the difference between the two can be confusing, it is essential that we understand the difference to plan a successful Intranet. One must be clear on the purpose and function of each and also know when the two can safely overlap. Creating an Intranet and creating an Internet presence for any require different focuses. Because the whole world can access company's Internet site, it must be seen as a marketing tool, a way to let the people know the companies' products and services. An Intranet, on the other hand, is linked to the company's internal ideas and goals. The Internet site presents the company's external face to the world while the Intranet contains the core of its being. Creating the Internet site has more to do with look and feel; data and the flow of internal information are the dominant forces on an Intranet site.

Really the differences between an Intranet and the Internet are question of semantics and of scale. Both use the same techniques and tools, the same networking protocols, and the same server

products. Internet content is by definition available worldwide. Mostly companies are not let allowed their data for outside consumption; indeed, some data, such as sales figures, client and legal correspondence, should be protected very carefully. From the scale point of view, the Internet is global while an Intranet is contained within a small group, department or organization. At the extreme is an Intranet that is global, but still retains the private nature of a smaller Intranet.

The Internet and the web are famous, and rightly so, for being a chaotic jumble of useful irrelevant information; the meteoric rise in popularity of web sites devoted to indexes and to search engines is a measure of the need for an organized approach. An Intranet harnesses the usefulness of the Internet and the web in a controlled, secure environment.

7. INTRANETS BASED LIBRARY & INFORMATION SERVICE

There are many services a library Intranet provides to its patrons. One of the simplest is a electronic table of contents (e-TOCs) alerting services for the journals that are received in either print or electronic format. E-TOCs can be sent by email to patrons who have signed up for a particular title from the library's holdings. The main benefit of the electronic TOC is the ability to access the article through the use of a hyperlink to the full text either in HTML or PDF.

Another easy web site addition is in the form of inter library loan and document delivery request forms. Not only are the forms easy to produce but they also provide patrons with the specific fields required by library staff to fill the request.

WebOPAC (Web-based online public access catalogs), particularly sophisticated systems which offer serial, cataloging, circulation, and acquisition modules not only assist patrons in locating library materials, but they also aid the library staff in tracking these materials. Serial claiming reports, pouting slips, circulation and patron statistics are just a few of the benefits that these systems offer. When shared by multiple libraries, these systems provide shared cataloging and acquisitions by providing a means of "copy catalog" resources already owned by another branch.

Many libraries also offer some type of subject guides to electronic information for their patrons in the form of lists of related materials. Another way to promote better Internet usage is to provide pathfinders of electronic resources for subjects, which would normally have a printed pathfinder.

Many libraries accept and reply to queries by email providing answers in 2-3 business days to remote and local users who have filled out the online form. But some libraries provide something of a live chat style interface to correspond directly with patrons through third party products such as ICQ and AOL instant messenger. "Ask a librarian" or instant messaging services provide answers to patrons in real time during regular business hours. This service is particularly useful for remote users and distance education students, but also allows other users to get an answer without having to come into the library. Depending on the size of the institution, it may be necessary to use several librarians to field all the questions, but most importantly, the service is easily implemented using existing technology.

Likewise, technological developments are quickly changing the way libraries catalog information. The addition of the MARC 856 field allows libraries to add multiple URLs (Universal Resource Locators) to catalog records providing access to electronic resources directly from the WebPAC. The current practice of forcing the patron to first search out a title on an OPAC and next check several lists to see if the library holds the material electronically is becoming archaic. Even if libraries don't use the 856 fields, they are likely to require some manner of keeping track of electronic serial holdings, particularly if the number of electronic subscriptions is in the tens of thousands.

The most promising solution for libraries is the database-driven Web site. The potential lies in the database fields, which can be manipulated by libraries to provide the types of information that patrons often use in their searches, not to mention the fields needed by the library staff. Filmmaker Pro and MS Access 2000 both support Web database publishing, but true dynamic content is created through server-side processing. The logic of a good database design combined with an application server's linking of its various components for displaying the information make the database-driven site more accurate and timely, not to mention far easier to manage.

8. INTERNET AND MY EXPERIENCES

Intranet based services are providing by various organizations like IMT Ghaziabad, ICRA, NIFT and NCAER, New Delhi. All above organizations have very rich collection of print and non-print reading materials well connect with Intranet and Internet technology and using LibSys Library automation software.

Institute of Management Technology (IMT), Ghaziabad

- CD-ROM database search
- Online borrower status
- Online reservation and request
- Online search various databases
- OPAC facility in campus,

ICRA, New Delhi

- Online Access of full text rating reports
- CD-ROM database search
- Current Awareness Services : New Arrivals
- Online request, reservation and borrower status
- Online access of various national and international electronic databases
- Web OPAC/ OPAC facility

National Institute of Fashion Technology (NIFT), New Delhi

- CD-ROM database search
- Digitalization of fashion resources like costume, handicrafts ...etc.
- Online borrower status
- Online reservation and request
- Online search electronic databases
- OPAC facility in NIFT Campus

National Council of Applied Economic Research (NCAER), New Delhi

- CASE (Current Awareness Services in Economics): A monthly update on Business, Economics, Policy News and Articles appeared in leading News Papers
- CD-ROM database search, Online access of subject databases
- Current Awareness Services: New arrivals of books, reports, and working papers.

- Current Content Services: A weekly article update of Indian economic literature.
- OPAC facilities, Online request, reservation and borrower status

9. PLANNING AND IMPLEMENTATION OF INTRANETS

9.1 Structure

A network is made up of several parts. Standards determine the specifications by which networks physically and logically operate. Architectures determine the fashion in which computers communicate with each other and can be either "peer to peer", or "client/server". Networks can have a certain topology, again physical or logical. Physical topology describes how the computers connect to each other physically. Included as part of the physical topology are the cables, connectors, Network Interface Cards, and other connecting devices. Logical topology describes how packets pass between network computers, or how information passes from node A to node B.

Networks also have a variety of access methods or logical topologies, but the most common is carrier-sensing multiple access with collision detection (CSMA/CD) which was one standard established by the Institute for Electrical and Electronics Engineers (IEEE). The standard is known as Ethernet and it has a variety of speeds and cable types that determine the classifications.

Networks also need connecting devices to allow the cables to connect between the nodes and other networks. These devices can be repeaters, bridges, routers, gateways, hubs, Ethernet switches, and Asynchronous Transfer Mode (ATM) switches and all have issues of security performance related with them.

Operating systems are also an important part to the structure of a network. There are the network operating systems (NOS), which run on the server computer, and there are the computer operating systems (OS), which run on the client computers and the server computers. Many NOS are dependent on the kind of computer OS in order to work (example: Novell NetWare must be loaded onto a machine with a PC OS.)

The final characteristic of the network environment and the term, which encompasses most of the network's investment, is hardware. Hardware is the computers that make up the network

and include all the items, which provide the means to communication; Client and Server. Client is a machine that has the ability to provide input to the network and is able to do computing on its own. Client often refers to personal computers (PCs). Server is a centralized depository for a specific function and often the server is named after the function that it performs. All servers have one common characteristic: they all perform a centralized service for the network that they occupy. Together these two aspects of the network make up what is referred to as client/server architecture and it is often in these sorts of network environments that Intranets are found. Intranets are simply the use of network technology infrastructure to perform the private communication needs of an organization. Intranets simply incorporate the architecture and standards of the network to facilitate their existence. A basic structure of intranet is depicted in Fig. 1.

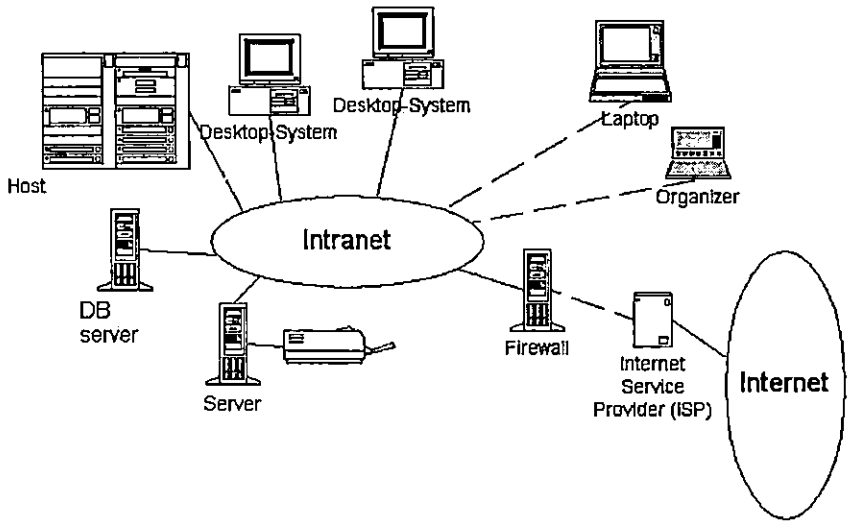


Fig. 1 Basic Structure of Intranet

9.2 Security

For an Intranet whether it will be connected to Internet or not there is a need to establish policies and procedures that will protect against the intrusions and internal disturbances. Internal security problems are the most common. The common threats to Intranet are external threats, internal threats, threats to hardware, threats to software, threats to information and threats from virus etc. To overcome these threats the need is to define security goals such as:

- Look at exactly what to protect – network hardware, software, confidential data, and network operations.

- Look at whom to protect it from – current users, previous employees, and outsiders trying to break into the system.
- Look at what is needed to protect it from – fire, smoke, floods, extremes of temperature and humidity, power outages, earthquakes, and theft.
- Implement measures that will protect assets in a way that organization can afford.

The evolution of many Intranets is the antithesis of strategic. Intranet servers have a way of popping up that is strikingly similar to the growth of the World Wide Web-uncontrolled, unplanned, and unrestricted.
Intranets are a business asset, and like any other of the organization's assets, they need to stand up to business scrutiny. Is the Intranet providing a return on the investment? What kind of return? How is it measured? Remember too that the organization is going to continue to have a technology budget, so it is not accurate to calculate an Intranet budget as though it is an either/or scenario.

9.3 Installation

The actual installation and implementation is a matter of executing the plan. We can build Intranet in testable section, making sure each one functions according to the expectations before continuing with the installation. For example, we may install one server and then create some pages and make sure they work together before adding other components. Network provider may dictate the order of installation, but it typically follows a sequence such as:

- Set up the server and client hardware.
- Make sure the combination works stand-alone.
- Install the network cards and cables and connect them.
- Install the system software on the server and test it
- Bring up the applications and test them all.

The order of implementation is practically the reverse of the order of planning and design. Implementation starts with the lowest level components of Intranet and then other layers on that foundation, testing each successive layer to make sure it works too, is very important. Hardware & Software installation: If the plan is good and the Intranet implementation team is reasonably sure about network layout then cables can be run at the same time when the workstations and servers are setting. Make sure that the cables need first for system testing is installed early enough. If the

network design is unsure in any way – for example whether it will have adequate performance – run only enough cables to perform a test string more cables when the network design is sure.

Set up the servers following the instructions provided by the server and network software vendor. Connect all the peripherals identified in the server worksheet and make sure the minimum requirements for memory and disk storage are met. Clients should be set up the same way in most cases, test if clients are functioning as stand alone PCs.

Next the system software should be installed on the servers and clients configured as the documentation and worksheets suggest. The worksheets should greatly assist the Intranet implementation team in the areas that might otherwise require a lot of guesswork, such as allocating server storage to volumes or directories, making different network resources such as printers available to end users and setting up system security.

Cable the server and clients together and set the protocols then start testing the system the documentation probably suggests some simple tests to make sure the basics are functioning before start trying the applications. After checking all is functioning well we can start loading and testing the applications.

9.4 Diagnosing Problems

If all does not go well, consult the network documentation of error messages. Building and testing Intranet in small pieces should help to locate the point at which things stopped working, like most the system problem solving, half the battle is isolating the problem to a small part of the system, then fixing the faulty part or replacing it with a good part. A network has many parts, possibly strung out across a large area, and can be formidable to debug some techniques for isolating problems are as follows:

- Make sure every workstation and server works alone, outside of the network environment.
- Test network connection cards with loop back plugs, if they are available or hardware diagnostic software.
- Test cables for short circuits with an ohmmeter. There should be no direct connection between the network cable conductors. Short circuits may be induced by a kink or pinch in the wire.
- Test applications software on local disk drives and printers if possible.

Try to narrow down the number of system components whose working status is unknown. Do this by swapping in components known to work. Consider using this technique with server and clients PCs, network connection cards, cables and even application packages that use the same or similar server resources as the suspect application. It may be difficult to swap a cable strung through the wall or ceiling, so if suspect it is bad, try moving the workstation or server to another location with a known good connection on the network and see if it works there. If it does, suspicions about the cable should be heightened.

9.5 Managing the Intranet

Every network needs a manager who is responsible after the installation. If the network is fairly static in the application it runs and its configuration of workstations and servers, it may be enough to assign a non technical user who can handle daily backups of the servers, answer questions about the applications, and assign new user accounts as needed. A consultant can be called in when network management needs go beyond these simple ones.

If network environment is dynamic (new applications are frequently brought up, new clients and servers added, security requirements undergo change, and the like), it may need an experienced person in-house or a consultant on call. Many management tasks can be handled by someone who is not a computer expert but who has received the proper training on the network.

10. CONCLUSION

Intranets have many traits that are beneficial to libraries. Intranets save time once they are implemented into a library environment. Intranets broadcast information to the organization and provide answers to frequently asked questions. Libraries can reduce the duplication of employee efforts by posting results of reference searches or programming resources for all to see and subsequently, make them permanently available. It helps to reduce clerical duplication and frees up time for the staff to assist the public with their searches. Improved service is the goal. Cost has been shown to be manageable for most situations and even large corporate libraries are able to justify their investment through increased employee response to the Intranet access of the library. Training and technology are issues that all librarians deal with and

the Intranet is nothing new in that respect. Therefore, librarians should take up the leadership role of Intranet implementation and become involved in the planning and policy development of this important resource.

Sharing is an underlying theme to this medium of document and information delivery. The organization that accepts the Intranet as part of the organization's philosophy will achieve results from Intranet implementation. However, if the employee does not make use of the Intranet then its potential will have been wasted. The increased potential for the sharing of information will change the corporate environment through a more open forum of information sharing. Communication between the library and its staff will improve and this can only benefit the work environment and the service that libraries provide.

Policies about the use of the Intranet and the management of it are important to the effectiveness of the investment. Standards are needed not only for the physical infrastructure of setting up and Intranet they are also needed for managing information on the Intranet, how it is organized, and when it is updated. Systems departments may be in charge of the installation and physical maintenance but it is the role of the librarian to manage the resource like any other information-gathering tool.

Dissemination and information retrieval are issues that librarians are trained for. Librarians must take an active role in the promotion of the Intranet and assume a proactive approach because Intranets do not operate on their own. They are simply a tool to better service. Mismanagement of this, like any other resource at the librarian's disposal, is a matter of poor judgment. The potential is there, it is simply a matter of harnessing it and making it a part of the library's makeup for better public service.

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SECURITY MANAGEMENT TOOLS FOR NETWORKS

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ABSTRACT

Security on networks is a very broad subject, which answers to the various attacks, vulnerabilities, intrusions that are found on the network. This paper presents the concepts of security management and its tools for networks. It concludes with intrusion detection systems and anti virus packages

1. INTRODUCTION

The dawn of Internet has enabled the sharing of resources, data transmission, and communication on the networks. Developments in computer science is now not confined only for inventing speedy processors, RAMs, creating high cache memories, large capacity hard disks, but, it is the speed and mode of the connectivity of networks for resource sharing and communication.

The concept of networks influenced the basic definition of computer, where earlier, the computer was defined as a *scientific calculator* has now being defined as that a computer is a device, which *participates in the network activity*. Presently, the charm and style of computer being used is due to its *network and capabilities*. We all are witnessing the drastic development in the communication technology, accessing resources, transacting with other organizations, irrespective of geographical and physical limitations.

Networks have occupied a prominent place in the computer technology and most of the activities are through networks. Networks are like highways, where the vehicle is just set to a wide road. While transferring on road, a security measure has to be followed by the driver of the vehicle and there should be safety rules that are imposed by the transport system.

In analogy of the above concept, the secured connectivity for data transmission, transactions, and communications is the basic awareness necessary for a Library and Information personnel responsible for the networking activity. Library and Information Professionals are the providers of the information service using networks and hence the knowledge of security aspects that revolves around the networks.

The computer network is a system of interconnected computers. The networking concept has made such an impact, that the whole communication technology is based on protocols which facilitates resource sharing, emailing, transfer of data over the networks, voice over protocols, telephony over protocols, video conferencing, business transactions, etc., Networking is the crucial factor of the present era, where the research organizations, business houses, banks, libraries, educational institutions, hospitals, manufacturing companies, etc., are all dependent on networks for one or the other information and communication.

Network being the driving force, the data that passes on the network is precious. Considering the features of data being confidential, precious, rare, possessing copyrights and patent, its proper protection and propagation are also equally important.

We being the information providers in the society are a high time for us to know in what best ways, we can provide the information without causing any damage to its originality and the transactions being smooth without any disturbances[1].

The following are the essential concepts that information professional must adopt in providing the information services. They are:

1.1 Secured Shell (SSH)

1.2 Secured Socket Layer (SSL)

1.3 Firewall

1.4 Intrusion Detection Systems (IDS)

1.5 Antivirus packages

1.6 Security policies

[1] Breaking of passwords, ip spoofing, dns spoofing, denial of service, session hijacking, etc.,

1.1 Secured Shell (SSH)

Secured Shell is a protocol for accessing a remote computer in a secured manner. It provides an interface for the users and administrators to access the remotely located computer and execute all the commands as they were using the first terminal of their server/computer. The SSH is a Unix Shell connection that is established between the remotely placed server to the client located in far away place in a secured connection, wherein the data is encrypted through out the transmission including the password.

SSHD is the daemon that listens for connections from clients. It forks a new daemon for each incoming connection. The forked daemons handle key exchange, encryption, authentication, command execution, and data exchange.

SSH is a pack of three utilities namely slogin (secured login), ssh (secured shell), scp (secured copy). The encryption algorithms used could be of TripleDES, IDEA, etc.

There are many packages that provide Secured Shell access between two hosts. There are also commercial packages available for the SSH connectivity. OPENSSH is the open source program which allows for the SSH connectivity between the server and client. Openssh[2] has found to be a reliable package being implemented successfully on Linux servers. The Putty is a freeware client program for SSH connectivity.

1.2 Secured Socket Layer (SSL)

Secured Socket Layer is a protocol developed by Netscape to transfer the data in a secured manner on Internet. SSL works using a private key to encrypt data that is being transferred over SSL connectivity.

Many browsers support SSL and many websites are now using SSL to transfer their data on the websites in a secured manner. SSL protects the communication on a HTTP channel and therefore associated with web pages. It is also widely being used in Email sending and receiving. The mail transfer agents (MTA) like postfix, qmail can be configured for SSL, wherein an encrypted channel is being created between the client and the server and the data is encrypted and transmitted. Transport layer

[2] http://www.openssh.org furnishes the complete documentation of openssh.

security is another protocol, which grew out of SSL implemented for web transactions. The websites that has a secured socket layer will have the URL address beginning with https instead of http.

There is also S-http which means that the website uses a secured http where in the individual messages are sent securely. In contrast, https transmits the complete website data in a secured fashion.

SSL uses the public-and-private key encryption[3] system from RSA[4], which also includes the use of a digital certificate[5].

It is very much necessary that data on the website namely the email IDs, personal information, credit card details need to be encrypted with strong keys and procedures, so that the transmitted data is not manipulated. Secured information transfer is the prime importance of today's world of networks. The voluminous and sensitive data that is being transmitted between the client and the server is to be properly protected in its transition. The SSL plays a significant role in providing such security.

SSL authenticates the client and the server to each other, ensures the data integrity by checking for data tampering, data privacy is achieved wherein the client requesting for the required data is fetched on session based. The SSL is a set of protocol consisting of Record protocol, Handshake protocol, Change Cipher, Spec Pprotocol and Alert protocol.

There are many commercial and open sources in providing SSL packages. The open source package namely openssl[6] is found to be implemented successfully on linux servers.

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[3] Encryption is the method of prevention of data being read or changing by an unauthorized person. The process of converting the plain text message into a human unreadable format. Different Encryption System provide different levels of encryption. Some might provide 112, 128,168,1024 bit encryption.

[4] RSA is a public key cipher which can be used both for encrypting messages and making digital signatures The letters stand for the names of the inventors: Rivest, Shamir and Adleman. The company RSA Data Security Inc. takes its name from this algorithm, and has acquired the rights to the patents, which cover it.

[5] Digital Certificate is a digital code attached to an electronically transmitted message, which uniquely identifies the sender. It is of great importance in commercial transactions. It identifies the sender through a digital signature as we do with a written signature.

1.3 Firewall

A firewall could be hardware or software or a combination of both which secures the access to and from the LAN. A firewall allows only specific kinds of messages from Internet to flow in and flow out of the internal network is presented in Fig. 1. This protects the internal network from intruders or hackers. A firewall is installed at the gateway server or at the router level wherein it segregates the LAN, so that there is no direct access of the LAN Hosts for any resources. There are different levels of applying the firewall depending on the type of organization and its services that are being used and offered on Internet. There are Packet filtering mechanisms that are used as Firewalls, Proxy Based firewalls, Port based Firewalls, etc.,

It protects the LAN from unauthorized access, blocks certain types of traffics, blocks the IP addresses of the LAN Computers.

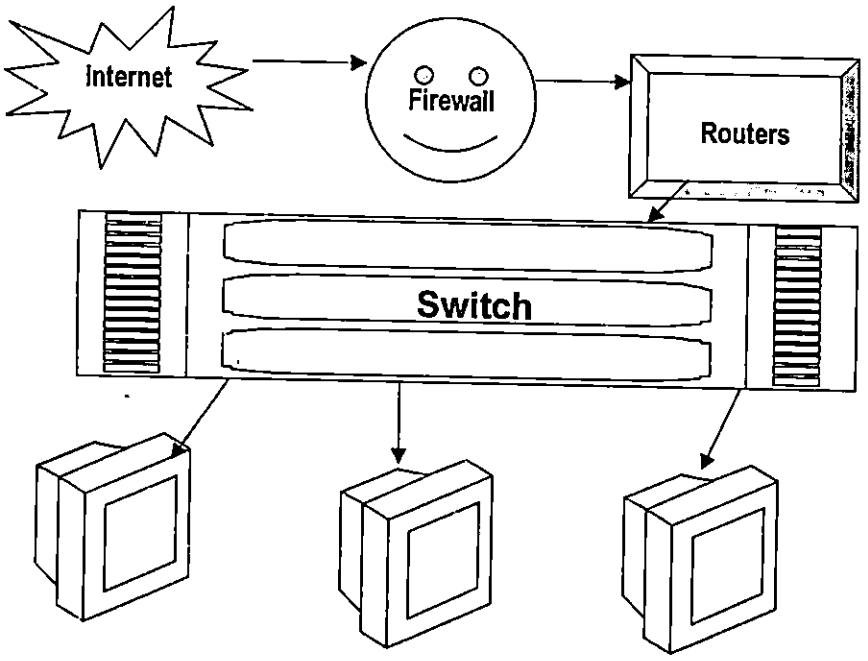


Fig. 1 Firewall protection in flow of data

There are hardware firewalls namely SonicWall, Watch guard, Cisco's PIX 501, etc.

[6] http://www.openssl.org furnishes the complete documentation of openssl.

The software firewall can be implemented on a server or an individual machine, which then becomes personal firewall. The firewalls give the options and menus, which protocols, ports, destination and source address needs to be opened or blocked for access. The administrator must carefully study the requirements of the organization and keep open only such applications and block the rest, which prevents him from hacking into the private network.

The software firewalls that could be implemented on linux servers are IP Tables, shore wall (which works on IP Tables).

1.4 Intrusion Detection Systems

Intrusion Detection Systems is a sort of defense system, which detects the hostile activities on network. The objective is to detect and prevent the hacking attempts. One key feature of intrusion Detection systems is their ability to provide a view of unusual activity and throw alerts for administrators and block a suspected connection.

There are two types of Intrusion Detection Systems: They are Host Based Intrusion Detection Systems ((HIDS) and Network Based Intrusion Detection Systems (NIDS).

The Host based Intrusion Detection software resides on a computer and monitors the incoming connection to the host. It examines the network packets to the host. It protects the host from suspicious packets. There are HIDS tools which monitors the super user activity, the file systems manipulations can be checked through tools like Tripwire, kernel based intrusions can be checked through tools like Open Wall, etc. The software tools like Snort, Dragon, etc., perform monitoring of Host based intrusions while flashing alerts when they come across unusual activity on Hosts.

The Network based Intrusion Detection software detects the data about on the networks. The NIDS analyzes the network packets that reach the network interface card. NIDS can be installed on active network devices like Routers. The NIDS detects the packets that is being continuously hitting the host and choking the network. There are types of viruses, which could block the network and deny packets entering into the network. The NIDS are Cisco Secure IDS, IP traf, dragon, etc., Intrusion Detection System can be *passive* which means that they might only alert the

user and *active* IDS performs an advanced function of each performing necessary action for the intrusion it has detected. Intrusion Detection System is a vast area of study, wherein each node on network can be monitored (NNIDS). The processing of detection could be an Audit trial processing or on-fly processing. The IDS detects the intrusions based on predefined algorithms and parameters, signature analysis, data mining, expert systems, etc.

IDS tools are very essential to monitor the network traffic and host based attacks. It is not sufficient that IDS alone can prevent the computer host or the network. It is always recommended that an IDS have to go along with a good Antivirus package and a Firewall. With the proper IDS, Firewall, Antivirus on a system, decreases the risk of attacks.

1.5 Antivirus Packages

The antivirus package is an essential supplement that needs to be installed along with primary software packages like OS, office suite, networking software, drivers, etc., especially, when the system is participating in the network, or using network resource, the system is exposed. The open ports, improper firewall definitions attract viruses.

The Email is the main channel for propagation of viruses. For example the Love Bug, SasserB Worm just hit the whole of the computer community. It caused enough breakdowns of the systems and blocked the network traffic, buffer overflows, etc.

The Email Server needs to be updated with the viral signature database, spam-controlling tools (Eg: Spamassassin), Firewall, IDS Tools to keep a watch on malicious activities that hit the Email Server. The appropriate patches and updation to virus definitions are utmost necessary for keeping the system secure. The reasonably good virus packages on windows hosts are Norton, McAffee, AVG, etc. TrendMicro, Sophos, AmavisNewd, Clamav, etc., are reliable on Linux Servers. It is highly recommended that Antivirus alone do not perform completely, unless there is a corresponding effective Firewall and IDS Tool.

1.6 Security Policies

Defining a Security policy and implementing the same, across the organization, improves the throughput of the network resources,

employee thereby the organization. The Security policies help the organization to function in a disciplined manner using the networked resources for the purpose of production of a good output. The Security policies must be understandable, consistent, easily enforceable, well documented, flexible, periodical revival, mentioning of punishments for those deviated from the rules.

Security policies are a comprehension of Do and Don'ts in the organization. By following the procedures laid out by Security policy, the organization can concentrate its valuable time and attention on production oriented works instead of carrying out the work of a police department. Security policies are to be drafted in each and every organization for using the network resources in a disciplined manner.

2. CONCLUSION

Security on networks is a very broad subject, which answers to the various attacks, vulnerabilities, intrusions that are found on the network. As the Internet is dominating the field of information science and communication, the field of study of security issues on network is also corresponding growing. It is a demanding time to be aware and also knowledgeable in using the security tools on the networks and hosts.

This paper has attempted to put forth the issues related to the security aspects that are crucial for an organization participating in the network activity. There are many more aspects, which are beyond the scope of this discussion. I have discussed the fundamental tools that an information science professional would need to monitor his resources in an organization.

The implementation of encryption keys, secured protocols, antivirus, firewall, IDS tools, Security policies can evolve at a better method in achieving the secured resource sharing and communication over the networks. Finally, it is the role of a Library and Information professional as a *master controlling authority* in analyzing and checking the logs, alerts, reports and ensuring the networked systems are away from the attacks.

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WIRELESS NETWORKING IN LIBRARIES

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ABSTRACT

The advent of computer networking as an accepted part of Library and Information infrastructure has had a very significant impact on the way in which Library and Information system are perceived and increasingly on the roles and work patterns of those who work in them and those who use them. Great advancements have taken place in the field of Information and communication in the last decades. Magnificent and pioneering changes are expected to take place in this field in the coming decade. Networking technologies are going through a sea change. This paper highlights a brief view of the likely network technology which is emerging like the cellular/Mobile technologies where most personnel communicate in the country .The impact of this will make possible to go for wireless libraries. It also highlights the characteristics feature, the benefits and issues in going for wireless network in libraries. It concludes with the hope that in near future the wireless technologies will play an important role in the storage, retrieval and dissemination of Information in libraries.

1. INTRODUCTION

Wireless connectivity is the new buzzword in computer network. It is now quite feasible to conceive of the Library as a distributed network of Information sources rather then centralized repository of recorded knowledge. This shift in perception has dramatic consequence for both information professional and the community of users, many of which yet to be fully worked through. Nowadays networking has become inseparable from Libraries and the Libraries should prepare with the new technologies. This developing technology offers great potential for broadening access to library services in ways never before conceived. Wireless data communication may be the next logical step in the evolution of library information systems.

Wireless technology has become very popular however there is common concern over how secure it really is. It is true there are imperfections in some features of wireless technology but it is also true that you can set up a wireless network that is adequately secure especially for a library. Even if you had the most advanced wiring installed into your Library, you'd still appreciate the benefits of wireless networks. The biggest benefit comes with mobility - and the ability to use your notebook PC, touch screen tablet, or other device from anywhere in the Library and without being tied to a wall outlet.

2. WIRELESS NETWORKING

Wireless Networking is one of the several ways to connect the computers. It creates a network by sending radio-frequency signals between your computers to share information. It connects computers to Computers networks without physical wire connections. A wireless network can provide network access to computers, databases, the Internet and OPACs both within and between buildings. The lack of a physical connection means that users are able to roam or work wherever they wish and still have access to the computer network. As a laptop with a wireless network card is completely portable throughout the library. A huge range of organizations in both the public and private sector enjoys the benefits of wireless networking. There are three main types of wireless network. They are:

Wide Area Network (WANs)

Local Area Network (LANs)

Personnel Area Network (PANs)

2.1 Wireless WANS

A Wireless WANs is a computer network that spans a relatively large geographical area. It connects geographically disparate sites using Satellite or radio transmitters. Roof antennas are installed on buildings that allow the site to connect to a central network. They are flexible and easier to install and cheaper than a traditional network. It allows multi-site organizations like Universities to connect to the same network. The coverage is generally offered on National wide level with wireless network infrastructure provided by a wireless service carrier. Computers using a traditional WAN are connected via leased lines or telephone system. They give Internet connectivity over a much broader coverage area for mobile users such as business; travelers or field service technicians. It allows users to have access to the Internet's e-mail and corporate application and information even while away from their office. Wireless WANs are existing cellular telephone networks so there is also the option of making voice calls over a wireless WAN. Both cellular telephones voice calls as well as pass data traffic on wireless WAN networks. A wireless WAN however operates in tightly regulated frequency 2.4 GHZ band and it implies much better data security and protection. Cellular wireless WAN network are extremely secure.

2.2 Wireless LANs

Wireless LAN's are a valuable networking tool for use within the building or as an extension to the wired network and for linking two or more buildings together to provide users with the ability to share data and resources. A Wireless LANs allows computers at one geographical location to share information and devices such as printers. A wireless LANs typically uses radio waves, which allow network PC cards plugged into a PC laptop to connect to a traditional Ethernet LAN. It usually support data rates of 11Mbps and have a range of 30-300 meters with signals being able to pass through walls. It offers many advantages over traditional such as mobility, flexibility, scalability, speed, and simplicity and reduced cost of installation. Wireless LANs provide all the functionality of wired LANs with increased mobility for users to access their network from anywhere in the building and installation is relatively fast and easy with no need to disrupt the fabric of the building or dig up roads to lay cable. There are three types of wireless LANs infrared, microwave, and spread-spectrum. Infrared data transmission is a well-developed, mature technology and is

enjoying great popularity. By using intense light beams to transmit data, it permits faster transmission speeds than many other wireless LAN technologies. Infrared devices are less expensive than other wireless LAN devices, but not as cheap as standard network cards. The drawbacks of infrared systems are that they are limited to line-of-sight transmission, sending and receiving units must be closely aligned, and the data path must be kept unobstructed.

Microwave signals allow high-speed data transfer rates and have the advantage of penetrating walls. They can also support applications requiring full-motion video transmission and point-to-multipoint broadcasting. Microwave-based LANs have the same drawbacks as infrared systems in that transmission is limited to distances up to 15 miles, sending and receiving units must be closely aligned, and the data path must be unobstructed. Microwave systems have been used with success in deploying wide area networks (WANs) for multi-campus educational institutions. With the current state of microwave technology, these systems can offer substantial cost savings over leased lines and fiber optic connections.

A spread-spectrum system is one in which the transmitted signal is spread over a wide frequency band, much wider, in fact, than the minimum bandwidth required to transmit the data being sent. Some systems use "frequency hopping" to jump around the assigned array of channels. Other systems use a faster direct-sequence spread-spectrum (DSSS) technique. The constant changing of frequencies helps speed transmission rates and increases data security. Spread-spectrum systems operate in the industrial, scientific, and medical (ISM) bands of the radio spectrum (902-928 MHz, 2.4-2.484 GHz and 5.725-5.85 GHz). AT&T's Wave LAN and Telxon's Arlan are examples of two types of spread-spectrum systems currently available. Spread-spectrum signals can penetrate walls and can reach transmission speeds of up to 3 Mbps and a range of up to 1,200 feet. Wireless LANs will get a tremendous boost with the soon to be released IEEE 802.wireless LAN standard. The lack of standards, high prices, and perceived low transmission speeds has been the main issues suppressing wireless LAN development. The new standard will allow similar wireless LAN technologies to interoperate; it will also enable wireless LANs to work with existing wired LAN technologies such as Ethernet and token ring.

2.3 Wireless PANs

A Wireless PANs allows electronic devices within a few meters of each other to communicate and synchronies information .The leading force is Bluetooth a short-range radio technology that simplifies communication between different devices. Already computer devices are being sold with Bluetooth preinstalled.

3. WORKING OF WIRELESS NETWORK

The wireless networks send and receive data to and from laptops and handheld devices such as cell phones, PDAs and the cell phone/PDA hybrids like the Treo. The resulting nomadic computing environment allows for flexibility, unencumbered by the need to locate wall plugs and hardwired computers. Many libraries are using Wi- Fi to deliver library content to users. Wi-Fi (wireless fidelity) refers to wireless local area networks. All wireless technologies use standard technology saddled over a wireless medium-airwaves. The major advantages of the technology are that there is no cable between network access points. It requires a wireless access points, a wireless PC card, a wireless PC adaptor and a network connection for the access point. The important factor is that only the one access point needs a network connection, rather than each computer. If the wireless connection is over a WAN then the additional hardware would include antennas to boost the signal. The limiting factor of wireless networking is the distance versus bandwidth because the further the computer is from the access point the slower the speed of data rate transfer. Although the connection has the possibility of 11Mbps it can be as 1Mbps as the distance increases. However, although 1Mbps would be very slow for an Ethernet network connection, it is still almost 30 times faster than 56K modem.

4. WIRELESS NETWORK AND LIBRARIES

Wireless network is like any other computer network. It connects computers to computer networks without the need for physical wire connection. Just as many librarians were unfamiliar with the potential of desktop computers in the early 1980s, we again find ourselves on "the outside looking in" when it comes to wireless data communication. The explosive growth of the Internet and the continued proliferation of electronic information resources place libraries square in the middle of revolutionary changes in the way information is stored and accessed. These dramatic changes in wire/cable-based electronic information delivery are paralleled by

developments in the wireless realm. If librarians are to take advantage of the great potential offered by wireless data communication, it is imperative that we understand at least the rudiments of this technology.

Wireless networking is evolving and the connectivity gives libraries the opportunity to introduce new services and extend current services to move users. It helps users to access digital information without connecting physically and system administration can set up or extend networks without installing wires. Mobility is the most attractive feature of wireless networking .It is more flexible than wire networking. It is an excellent solution for librarians with the historic buildings or older buildings where the installation of wired networking is either impossible or very expensive .It saved from the constant wiring and rewiring by installing wireless network. Installation is very easy and be set up anywhere any place in the library and it does not need space also. It also makes it easy to move computers and other devices without the need to reconfigure the network. The mobility and the resulting flexibility it provides to computer user are what make a wireless computing environment so attractive on campuses and in libraries.

The University of Pune has already goes wire free to network. And they were able to roam with a laptop from one zone to another without your screen registering even a minute disturbance. They provide certain departments with Wireless LAN cards so that they immediately connect to the system. One of the most attractive components of wireless connectivity is the ability to break the physical restraints of buildings or landline telephones. Wireless connections to information resources provides a means for marine biologists to access directly library information or other computer databases while on a boat offshore; likewise, facsimile copies of drawings or photographs can be sent directly to onboard computers without the need to return to shore. These same services would be available to archaeologists and other researchers involved in field research many miles from the nearest library. Wireless connectivity gives libraries the opportunity to introduce new services and extend current services to more users.

5. SIGNIFICANCE OF WIRELESS NETWORKING IN LIBRARIES

As Information Technology is advancing Wireless connectivity becomes a new buzzword in computer networks. It involves

connecting laptops, mobile libraries and even fridges to computer networks, without physical wire connections. Wireless connectivity means that individuals can potentially access the Internet, CD-ROM networks and office networks from anywhere and at any time. It offers immeasurable benefits. The significance of Wireless networking is:

(i) It provides access to multiple computers databases, the Internet and Library OPAC throughout the library;

(ii) It permits quick connectivity to the network;

(iii) Simplifies network Configuration;

(iv) Sharing of peripherals, files, multimedia resources and database are easier;

(v) Using laptop computers library users can access electronic media and also be physically near whatever printed material they want;

(vi) Web OPAC is accessible from any corner of the campus through access point;

(vii) The transfer of information is normally faster resulting in better service and improved user satisfaction, location independent access for network administrators for easy on-site-trouble-shooting and supports;

(viii) The greatest significance is that while shifting the library building it can be shifted without affecting the Network System.

The advantage offered by wireless networks is the ability to provide computer network access in buildings not suitable for wired networks. In situations where concrete walls or historic structures are involved, wireless provides the best solution to network connectivity. In spite of it significance it has its limitation too. So, we should consider some issues for installing wireless Networks in Libraries. Some of the issues are as follows:

(i) Simple to install, set up, use and manage;

(ii) Reliable and easy to expand as the library network grows;

(iii) Compatible with other network devices;

(iv) Backed by easily accessible, sound technical support;

(v) It should meet the prescribed standard for safety;

(vi) The complexities should be known.

Therefore Libraries need to be flexible when planning their wireless services and keep abreast of the latest developments.

6. CONCLUSION

With the increasing development of wireless network technology at home and abroad, people have found it more and more convenient and flexible to use than cable network. In India also it is coming up very slowly. It is an exciting stage of development and in future it will eventually dominate its cable dependent competitions. The use of wireless connectivity in libraries offers opportunity to provide the same standard of service to users regardless of location. The staff can also manage stock and statistical information in a far more efficient way. In addition wireless networking may offer libraries previously seen as too remote or expensive to network the opportunity for same high-quality networked services as a central library. The libraries and information centers cannot close their eyes on the development of wireless network, which are very useful. They should adopt these technologies to provide cable free, fear free and hassles free services to clienteles.

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WIRELESS TECHNOLOGY: DESIGN/EXTENSION OF LIBRARY NETWORK

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ABSTRACT

Today's Wireless equipment and software are becoming widely and cheaply available and very simple to use that in most cases, It is just a question of plugging it in and following the prompts but there is very much unawareness about it in Library Professionals. The paper deals with the concept of Wireless Technology, its importance for the Libraries, types of Wireless Network, available standards for Wireless Network, security features, essential Hardware/Software, its cost and efficiency etc. The paper presents the basic knowledge required for a layman to know about Wireless Technology to set up a Wireless Network.

1. INTRODUCTION

Basic aim of any library is to provide right information, to the right user, at the right time. Some time right information is not available and sometime right user is not present. User cannot wait and come frequently in the library because of their busy schedule. But they want to use the library facilities. Now it becomes our first and foremost responsibility to make our services accessible to them beyond the Library premises.

Wireless networks are emerging fast as latest technology, to allow users to access information and services via electronic media without taking geographic position in account.

2. WIRELESS NETWORKING

The term Wireless networking refers to technology that enables two or more computers to communicate using standard network protocols, but without network cabling. Strictly speaking, any technology that does this could be called Wireless Networking.

Wireless - the name says it all: Cut the cord. Wireless networking is cable-free, no-strings-attached networking. Most wireless networks send data through radio waves, broadcasting in all directions. Fig.1.1 and 2 presents typical home network using Ethernet cable and wireless network sharing a single Internet connection

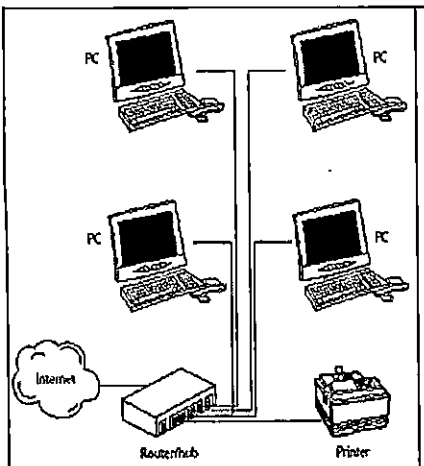


Figure 1-1: A typical home network using Ethernet cable.

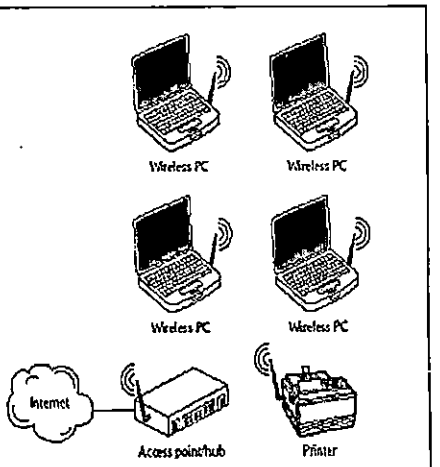


Figure 1-2: A typical home wireless network sharing a single Internet connection.

Information Centre's should be very quick to serve any query; high speed Internet and e-mail access are essentials for those. The smartest ways to provide these services is through a wireless local area network (WLAN). Keeping in the mind of these factors one can go for wireless technology.

2.1 Cost Effectiveness

Affordable technology, low installation costs and inherent scalability combine to make wireless networking a sensible option for Library and Information centers on a tight budget.
A high-performance WLAN lets you:

- Purchase and install only the networking infrastructure we need today, and expand coverage incrementally as our Library adds new branch/departmental Library.
- Save rewiring and network documentation costs anytime you add users, reconfigure Library space or move operations.
- Improve productivity while offering users a rich and agile networking experience at a Reasonable cost.

2.2 Wireless networking provides flexibility

With a wireless network, we can reduce the amount of cabling required to get your Library up and running. So installation and setup are quicker, easier and less expensive than wired alternatives that require significant infrastructure in-vestments. In addition, WLANs offer the flexibility to rapidly add or move users, and expand coverage in cost-justifiable increments.

2.3 Wireless networking improves the Library Usage

WLANs give users the freedom and convenience to access library services when and where they want. Fig.1.3 presents wireless and Ethernet on the same network.

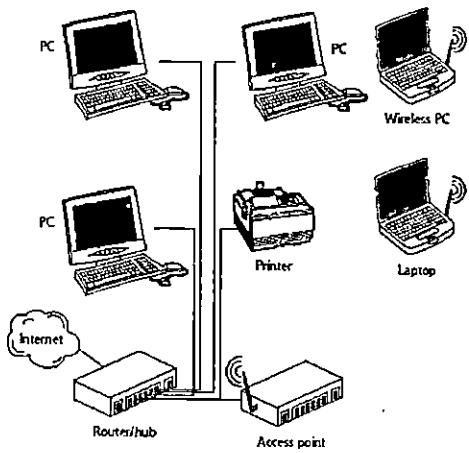


Figure 1-3: Wireless and Ethernet on the same network.

3. TYPES OF WIRELESS NETWORKS

A wireless network is any collection of end points that can (at least) receive, and send, a signal or information from or to broadcast access point, without using wires. There are many types of wireless computer networking technologies, including:

3.1 **RFID (Radio-Frequency Identification) systems**: There are many sub-varieties of this technology class, mostly used for very small network.

3.2 **Infrared/IRDA**: This is line-of-sight low power optical networking.

3.3 **HomeRF**: An older wireless PC networking standard that is rapidly disappearing.

3.4 **Bluetooth**: Bluetooth is a wireless personal area networking (WPAN) technology used for low data rate wireless networking mostly for connecting peripherals such as Printers, PDAs etc., but rarely used for LAN client purposes.

3.5 **Wi-Fi**: WiFi stand for wireless fidelity is a wireless standard that promises mobility while offering data rate comparable to those of a wired line. WiFi is a collection of standards given by IEEE in 1997.

4. WLAN STANDARDS

Before getting too far into the decision-making process, it's best to determine which type of WLAN is right for your Library. Currently, the Institute of Electrical and Electronics Engineers (IEEE) have ratified three standards: 802.11b, 802.11g and 802.11a. The wireless standard you choose depends on application requirements and your usage patterns.

4.1 802.11b

802.11b has a maximum data rate of 11 Mbps per channel—faster than most wired broadband connections. Key advantages of this standard are better penetration through walls and other obstacles, and greater operating distance in the Library or other enclosed

environments. Among today's wireless standards, 802.11b is by far the most widely deployed, so it can be a good choice.

4.2 802.11g

802.11g have all the advantages of 802.11b in addition to offering a maximum data rate of 54 Mbps for faster performance. The 802.11g standard is backward compatible with 802.11b since it operates in the same 2.4 GHz frequency band. This makes 802.11g a good choice for small and medium-sized Libraries

4.3 802.11a

Similar to 802.11g, 802.11a also provides a maximum data rate of 54 Mbps, but operates in a separate 5 GHz frequency band and has at least eight available Radio channels for frequency reuse. Increasing the number of non-overlapping channels increases performance capacities while offering scalability in deployment. 802.11a provides great bandwidth for collaborative environments and data-rich files, but is not compatible with 802.11b or 802.11g. However, it can coexist with these two standards with no effect on performance. Table-1 presents the comparison of wireless standards.

Table-1 Comparison of wireless standards

Standard	IEEE 802.11b	IEEE 802.11g	IEEE 802.11a
Available RF Channels	3 non-overlapping	3 non-overlapping	8+ non-overlapping (4 non-overlapping in some countries)
Frequency band	2.4 GHz	2.4 GHz	5 GHz
Maximum data rate/channel	11 Mbps	54 Mbps	54 Mbps

In India we can deploy 802.11b (The basic 11Mbps version of Wi-Fi) freely in door or within a campus. Outdoor usages beyond a campus, or the use of other standards like 802.11g (The 54 Mbps version), require a license.

Security has always been a concern in a wireless networks, so it is important to check out the security features of an access point before we buy it. There are various security modes providing different levels of protection the most basic is WEP (Wireless Equivalent Privacy) encryption, which is present by default in all

access points. But WEP has been found to be week and, therefore, not always suitable for security a Wi-Fi network. Look for other security modes, such as:

- MAC-address based filtering,
- Radius based authentication
- WPA (Wi-Fi Protected Access).

5. CONNECTIVITY WITHOUT WIRES IN WI-FI

One needs three things to set up your wireless network:

(i) At least two computers.

(ii) A wireless access point (at least one).

(iii) A wireless interface adapter (one for each computer)

5.1 Wireless Access Point

A wireless access point (AP) connects wireless devices on your network to each other. Every wireless local area network (WLAN) needs at least one AP and AP is usually the most expensive piece of hardware in WLAN (other than the PCs, of course), ranging in price approximately from Rs. 4,000 to Rs. 52,000. Table –2 shows the comparison of Wi-Fi Access Points (AP)

Table-2 Comparison of Wi-Fi Access Points

Models	Range Mtrs	Range with excell-ent signal strength Mtrs	Security modes	Max throu-ghput Mbps	Streaming rate Kbps	Throughput with interf-erence Mbps	Price INR
802.11b AP							
3Com 8200	206	150	MAC	4.5	532	4.1285	52150
D-Link DWL1000	200	150	MAC, Radius	10	980	9	8000
Net Gear ME 103	209	48.5	MAC, Radius	4.5	490	4	15000
Cisco 1200	216	57	WEP, MAC, Radius	6.5	999	5.4	34543
Net4India	200	160	MAC	5	480	0.3	9800
802.11g AP							
Compex WPL 54G	161	48	MAC, Radius	14.4	954	11	9500
3Com11g wl 525	147	53	MAC, WPA	12.5	428	11.5	13930
Dlink DWL 2000	200	200	MAC, WPA, Radius	13	1000	11.4	8500

5.2 Wireless Network Interface Adapters

Like the Ethernet card on a wired network, the wireless *network interface adapter* translates between your computer and the network. The network interface adapter is frequently called a *network interface card*, or NIC. Your computer and the network speak different languages, called *protocols*, and the NIC acts as an interpreter.

Wireless network interface cards come as PC cards, USB adapters, compact flash cards, or PCI/ISA cards. Each computer on your wireless network needs an adapter. Table – 3 presents the comparison of Wi-Fi Networks Interface Adapters (NIC)

Table – 3 Comparisons of Wi-Fi Networks Interface Adapters (NIC)

Networking Connection Type	802.11b	802.11b	802.11g	802.11g	802.11g
Brand	Compex	Buffalo	DLink	Netgear	DLink
Model	WL11B+	WLI-CB-G54A	DWL-G650	WG511	DWL520
Frequency Band	11 Mbps	54Mbps	54Mbps	54Mbps	22Mbps
Data transfer rate	2.4Ghz	2.4Ghz	2.4Ghz	2.4Ghz	2.4Ghz
Interface type	PCMCIA	PCMCIA	PCMCIA	USB	PCI
OS compatibility	PC	PC	-	PC	PC
Price	2300	2500	3000	4400	3500

6. DRAWBACKS OF WLAN

Speed for start. A wireless network will have less capacity than a 100 Mbps Ethernet LAN. Your Internet connection won't be any slower, and gaming, file sharing, and printing won't be either. Depending upon how many users are on our WLAN, We should never notice a speed difference. Unless we regularly move huge files around on your WLAN, or back up large disks.

We may also face signal strength-concrete walls, foliage and trees etc. can block the wireless radio signals, causing speeds of access to reduce or access to be lost entirely. Correct placement of access points will handle this problem.

Security is also a key issue. If we aren't careful, we might end up having our network compromised.

Mixing 802.11g and 802.11b clients can sometimes cause everyone's access to drop to the lower 802.11b speeds. This is a technical shortcoming of current equipment. To avoid this, you can force your access points to work only in the faster 802.11g. This will, however, lock out any 802.11b clients.

7. CONCLUSION

This technical review gives a brief knowledge about wireless environment. A lot of technological revolution has taken place in the span of time to reach at modern wireless media. This media can now transmit audio, video and text and that too with much faster speed and accuracy, which are essentials for research and development.

Setting up a wireless library network is not difficult. It required less efforts and cost than a wired local area network (LAN). If you have networked computers using Ethernet cable, a wireless network should be an easy upgrade for you. If you haven't worked with Ethernet before or you are planning for networking with Ethernet cable you can change your mind and choose Wireless Technology.

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CHALLENGES AND COMPETENCIES FOR LIBRARY AND INFORMATION PROFESSIONALS IN THE DIGITAL ENVIRONMENT

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ABSTRACT

In the present Information Technology era libraries are facing a threat from the Internet and the vast pool of digital resources. Emergence of computers and communication technology has great impact on every facet of library activities and information services. In order to cope with the changing roles, functions and responsibility as envisaged in the electronic information age, library and information professionals would have to learn new information technology and management skills. In the emerging scenario, dominated by digital and network resources, the involvement of library and information professionals in organizing library services will increase manifold. The paper discusses the challenges faced by the library and information professionals and describes the competencies required by them in the digital environment.

1. INTRODUCTION

Librarianship is in the midst of a great change. A dynamic environment due to advances in information and communication technology is replacing the stable environment of the past. Technology is changing the nature of libraries and information centres. It is inevitable that in the new millennium the role of the library and information professional will constantly be redefined to reflect changes in both technology and the networked environment in which he operates.

2. CHALLENGES FOR LIBRARY AND INFORMATION PROFESSIONALS IN THE DIGITAL ENVIRONMENT

Developments in information technology have great impact on every aspect of library operations and information services. Due to the advances in science and technology, there is a rapid growth of information in different formats. The print on paper is slowly shifting to electronic publishing. The new medium has given a scope for more efficient means of storage, maintenance and quick access from remote places. As a result libraries need to develop electronic documents selectively, and get access to electronic information resources using network facilities to serve the users (Zink, 1991). Today library and information professionals are operating in an era of increasing competitiveness, limited resources, the need for increasing accountability and a technologically astute and demanding user population. Keeping in view these rapid changes the information professionals have to accept and adapt the phenomena of change in the library to provide effective and efficient information services (Martin, 1994).

3. LIBRARY AND INFORMATION PROFESSIONAL IN THE DIGITAL ENVIRONMENT

Libraries have been a major source of information for centuries, and have held a special place in the society. The growth of information technology has challenged this role and resulted in considerable instability and uncertainty among library and information professionals. They have been forced to redefine and restructure library resources and services and in the process, the library itself. The main aim of any information system is to provide the users with appropriate information without loss of time. With the advancements in information technology, the library clientele wish to have the information right at their own desk. In this modern era, the library should be proactive in nature (Bryant, 1997). Librarianship as a profession has never been monolithic in nature; the networked environment creates a situation that expands the functions of a librarian substantially. The library professional in the digital and networked environment, therefore should have to work effectively as a(n):

(i) Information expert, who has a fundamental understanding of information resources, including identifying, selecting, evaluating, securing and providing access to pertinent information resources.

Information professionals should have expertise in total management of information.

(ii) Technologist, someone who is technology savvy, is aware of new and emerging technologies and understands a library's technology infrastructure and its implications for the ability of the library to provide various services and resources and collect data regarding the use of those services.

(iii) Communicator, someone who has the ability to communicate effectively not only face to face but also non-face to face computer mediated forms of communications i.e. on line chat, e-mail etc.

(iv) Instructor, someone who can instruct users and other library staff on a number of network-based services and resources (e.g., computer use, Web searching, online data base use), as well as aspects of information literacy;

(v) Manager, someone who can manage varied and numerous projects, and delegate responsibility to others;

(vi) Negotiator, someone who is able to engage in informed contract negotiations with a number of content and resource providers such as database vendors/aggregators and systems providers;

(vii) Planner, someone who thinks strategically, strives toward a vision, and can develop and implement strategic planning initiatives. Librarians also need to engage in strategic planning activities that extend beyond the library to the large communities that they serve, such as a university, city, country, etc.; and

(viii) Evaluator, someone who knows the various assessment techniques available to them, the ways in which to use these techniques, so as to benefit the library's understanding of their services/resources, data analysis of the evaluation project collection activities, the interpretation of the results of such assessment approaches, and ways in which to feed the results of the evaluation projects into the library's

provision of services and resources and planning activities.

4. COMPETENCIES FOR LIBRARY AND INFORMATION PROFESSIONALS

In library and information science, there are a number of examples in which professional organizations have developed statements of competencies for segments of the community of library and information professionals. Competencies comprise of skills, knowledge, and personal attributes. These components must be present in the right balance for a person to be competent at a specific task, so it is important to understand what the components of a competency are in order to evaluate whether we have them or need to acquire them (Green, 1993). The organizational societal and competitive changes affecting library and information service organizations emphasize the need for effective leadership and the identification of professional and personal competencies in the profession. In the light of on going social technological and economic, changes the Special Library Association (2003), has revised "Competencies for Information Professionals of the 21st Century in June 2003. The Association has emphasized upon two types of competencies for informational professional:

4.1 Professional Competencies

Professional Competencies relate to the library and information professionals knowledge of information resources and the ability to use this knowledge as a basis for providing the highest quality information services. There are four major competencies, each augmented with specific skills, which are as follow:

4.2 Managing Information Organizations

Library and information professionals should know how to manage information organizations ranging in size from one employee to several hundred employees. These organizations may be in any environment from corporate, educations, public, government, to non-profit. They should:

(i) align the information organization with, and is supportive of, the strategic directions of the parent organization or of key client groups.

(ii) assess and communicate the value of the information organizations, including information services, products and policies to senior management, and client groups.

(iii) establish effective management, operational and financial management processes and exercise sound business and financial judgments in making decisions that balance operational and strategic considerations.

(iv) contribute effectively to senior management strategies and decisions regarding information applications, tools and technologies, and policies for the organization.

(v) build and lead an effective information services team and champions the professional and personal development of people working within the information organization.

(vi) market information services and products, both formally and informally, through web and physical communication collateral, presentations, publications, and conversations.

(vii) gather the best available evidence to support decision about the development of new service and products, the modification of current services or the elimination of services to continually improve the array of information services offered.

(viii) advise the organization on copyright and intellectual property issues and compliance.

(ii) Managing Information Resources

Information professionals should have expertise in total management of information resources, including identifying, selecting, evaluating, securing and providing access to pertinent information resources. These resources may be in any media or format. Information professionals recognize the importance of people as a key information resource. As information resource manager, they should be able to:

(i) manage the full life cycle of information which includes acquisition, classification, cataloguing, indexing and abstracting and dissemination of information.

(ii) build a dynamic collection of information resources based on a deep understanding of clients' information needs and their learning, work and /or business processes.

(iii) demonstrate expert knowledge of the content and format of information resources, including the ability to critically evaluate, select and filter them.

(iv) provide access to the best available externally published and internally created information resources and deploys content throughout the organization using a suite of information access tools.
(v) negotiate the purchase and licensing of needed information products and services.
(vi) develop information policies for the organization regarding externally published and internally created information resources and advises on the implementation of these policies.

(iii) Managing Information Services

Library and information professionals should know how to manage the entire life cycle of information services. They should be able to:

(i) develop and maintain a portfolio of cost-effective, client-valued information services that are aligned with the strategic directions of the organization and client groups.
(ii) conduct market research of the information behavior and problems of current and potential client groups to identify concepts for new or enhanced information solutions for these groups. Transform these concepts into customized information products and services.
(iii) research, analyze and synthesize information into accurate answers or actionable information for clients, and ensures that clients have the tools or capabilities to immediately apply these.
(iv) employ evidence-based management to demonstrate the value of and continually improve information sources and services.

(iv) Applying Information Tools and Technologies

Information professionals harness the current and appropriate technology tools to deliver the best services, provide the most relevant and accessible resources, develop and deliver teaching tools to maximize clients' use of information, and capitalize on the library and information environment of the 21st century. They should be able to:

(i) assess, select and apply current and emerging information tools and create information access and delivery solutions.

(ii) apply expertise in databases, indexing, metadata, and information analysis and synthesis to improve information retrieval and use in the organization.
(iii) protect the information privacy of clients and maintains awareness of, and responses to, new challenges to privacy.
(iv) maintain current awareness of emerging technologies that may not be currently relevant but may become relevant tools of future information resources, services of applications.

4.3 Personal Competencies

Every information professional should be able to:

(i) seek out challenges and capitalizes on new opportunities
(ii) communicate effectively
(iii) present ideas clearly; negotiates confidently and persuasively
(iv) build an environment of mutual respect and trust; respects and values diversity
(v) employ a team approach; recognizes the balance of collaborating, leading and following
(vi) plans, priorities and focuses on what is critical
(vii) demonstrate personal career planning
(viii) think creatively and innovatively
(ix) recognize the value of professional networking and personal career planning
(x) remain flexible and positive in a time of continuing change
(xi) motivate himself and others

While some of these qualities have long existed in the library profession, many are new and evolving. The library and information professional of the future is, increasingly, an information expert with a myriad of technology, management, communications, and assessment capabilities. The education process for librarians is continual and ongoing-it is not the case that, upon graduation from a degree program, the librarian is complete in his/her education. With technology changes, new assessment tools, and various other issues, libraries need to build a continuing education process for librarians to work effectively in the evolving field of librarianship. A library degree is a necessary, but no longer sufficient, qualification for a library career. Although

the core of the profession remains the same, the methods and tools for information delivery and the scope of the enterprise continue to grow and change dramatically. While maintaining their client and content-centered approach, practitioners increasingly require advanced knowledge of information technology to realize their full potential.

5. CONTINUING PROFESSIONAL DEVELOPMENT

In the library and information profession today, it is essential to constantly scan the horizon for new technologies, or new business models, which will impact the way in which the profession develops.

The main ways to keep abreast of future changes are as follows:

5.1 Reading key journals

It is not enough to simply read the journals of library and information science but also important to regularly read the key computing journals and the key journals that discuss the organization in which the information professional operates.

5.2 Attending Conferences

In addition, attendance is recommended at conferences that are not purely focused on the information profession, but cover the organization in which the information professional is employed.

5.3 Training Courses

There are many opportunities for training, which the information professional could, and should, seize. These range from traditional databases skills to training courses on project management, communications skills and courses in information technology. It is in the best interests of information professionals to adopt a proactive approach to manage their own continuing professional development.

6. CONCLUSION

In this digital and networked environment the library and information professional will have to ascertain the impact of information technology on the libraries and will have to acquire skills for effective and efficient management of libraries and

information centers. These competencies for library and information professionals form the basis for growth in the information age. It is important for librarians and information professionals to focus on the capabilities enabled by the networked environment rather than the complications brought forth by the complexity of network-based information resources and services. Continually emerging opportunities will propel the prepared professional into as yet unseen realms of advanced information retrieval, interpretation, synthesis, and product development and virtual services on a global scale.

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ESSENTIAL PROFESSIONAL SKILLS AND COMPETENCIES TO STAY FIT IN THE DIGITAL LIBRARY ENVIRONMENT

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ABSTRACT

The statement "We are living in a new economy – powered by technology, fueled by information and driven by knowledge. The influence of technology will go beyond new equipment and faster communications, as work and skills will be redefined and reorganized", indicates the revolutionary changes in the profession in handling the information.

Digital library is the new concept of library in the knowledge society. This metaphor describes the new specie of the library where the advanced ICT's are being used for faster dissemination of information suited to ever changing, increasingly complex and turbulent knowledge society. In this context, the traditional techniques and skills for handling information are becoming obsolete. Every profession is striving hard to expertise in every field of activities by adopting the emerging IT and LIS profession is not an exception. Competencies are the knowledge, skills and attitudes to do a job effectively and efficiently and help to remain flexible in the ever-changing environment. Along with the professional and personal competencies, expertise and willingness to use technology is the need of the hour. Librarian as knowledge manager has a greater

responsibility in sorting and sifting the knowledge maze. It is essential on the part of the professionals to sharpen the tools, techniques and skills to build the practically viable personal and core competencies along with e-competencies and managerial skills to satisfy the needs and aspirations of the users in the digital library environment. The paper emphasizes the role of information professionals in knowledge society and describes the need for development of specialized skills and competencies and concludes with some recommendations.

1. INTRODUCTION

The post-industrial society is clearly branded as the information society. Daniel Bell in his work 'The coming of Post-industrial Society' uses post-industrial society interchangeably with knowledge society for two major reasons. First, the sources of innovations are increasingly derived from research and development. Second, the weight of the society – measured by a larger proportion of Gross National Product and larger share of employment – is increasingly in the knowledge field (Weert, 1999). Knowledge is considered to a basic economic resource. Garfield states that information society is the one in which "the information which people need is available in the rapid and convenient way and is the ordinary state of affair"(Garfield, 1979) and this is because of revolution of the Information Technology. Though Web is with us for just over a decade but its impact is tremendous and has opened up new vistas, which can be listed as follows:

(i) New communications methods
(ii) New business opportunities and fundamentally new kinds of businesses
(iii) New media and sources of information
(iv) New forms of learning, interacting and teaching
(v) New forms of cultural and political expression and engagement; and
(vi) New communities for interacting in the virtual space

This transformational change has posed some critical challenges and paved the way for new opportunities. The peculiarity of this new information society has made the continuing change as the norm. The major two challenges that can be viewed are:

(i) The rapid and inexorable increase in the world output of published material

(ii) New information and communication technologies.

At the same time major opportunities thrown open by the technology can also be listed as given below:

(i) Reduced dependence on the library as a physical location: the availability of digital information resource over networks has the effect of bringing the library to the user.

(ii) Networking: The electronic technologies enable to integrate disparate resources both for analysis and for communication via a single interface.

(iii) Opportunities for wider audiences: the new technologies offer a huge opportunity to the professionals to reach wider audience.

To establish supremacy over the ever increasing information proliferation in multiple formats, the growth of the Internet and the rise of electronic communications and storage media the library professionals have to be very competent.

2. ROLE OF INFORMATION PROFESSIONALS IN KNOWLEDGE SOCIETY

Information professional has to play a vital role in the present society most vividly called as knowledge society. Here the knowledge plays a predominant role. It is also key resource required to all creative and developmental activities. Knowledge society is powered by technology, fueled by information and driven by knowledge. The main characteristics of the information/knowledge society have been defined as:

> "changed perceptions of the importance of the role of information, the growth in the amount of information now available and the wide variety of formats; the size and continued growth of the information sector in modern economies; and the rate of technological change and the impact of technology" (Mullins, 2000).

It is well known fact that the library and information science is a field transformed by the cyber revolution and digital libraries are

the visible output of this revolution. Digital library is the new concept of library in the knowledge society as this metaphor describes the new specie of the library where advance ICT's which led to the emergence of Internet and its chief resource, the World Wide Web (WWW) are being used for faster dissemination of information suited to ever changing, increasingly complex and turbulent knowledge society promoting higher learning and research throughout life.

As defined by SLA 'Information Organisation' are those entities that deliver information based solutions to a given market. Some commonly used names for these organizations include libraries, information centers, knowledge resource centers, content management organizations, etc. And 'information professionals are those who uses information in his/her job to advance the mission of the organization. The information professional accomplishes this through the development, deployment and management of information resources and services. "The information professional harnesses technology as a critical tool to accomplish goals" (Special Library Association, 2003).

3. NEED FOR DEVELOPMENT OF SPECIALIZED SKILLS AND COMPETENCIES

Looking at the vast growth of the information in multiple formats in the information and knowledge age, specialists in information management are essential. If library and information professionals do not keep abreast with the changing and emerging technologies, they fail miserably to provide the available information in the format suited for the purpose. To manage all sorts of information resources effectively and cope up with the ever-growing information and multifarious needs of the users, the information professionals require certain sets of essential skills and competencies.

In the digital environment competencies continue to be 'performance buzzword'. The competencies identify both the personal and professional knowledge and skills needed for library professionals to compete effectively in the information age and to set new standards of excellence. "In our profession competencies are the sum and substance to make our profession indispensable to the society, clients and constituents" (Scott, 1999). Emphasizing the importance of professional competencies Sylvia Piggott said in her introduction to the first edition of SLA's 'Competencies for Information Professional in the 21st Century'

"the criteria for successful performance in the information profession are constantly being raised as a result of innovations in technology, communications, and learning"(Jones).

4. COMPETENCIES

The need for skills and competencies is vital and the new electronic environment demands them. The proliferation of the information has to be controlled, packaged, and repackaged to fulfill the needs of the users' community. The existing tools and techniques have to be refined and sharpened to handle the complex information world. Identifying and locating the information resources in the traditional library was not that challenging as the collection was bound to the geographic location, and was restricted to navigate library catalogue. The transition from traditional library to electronic library or digital library enhanced the need for information skills development. "The skills, which were required by the information professionals during the period prior to the information age, are enumerated in the following way" (Ward, 1999) and these are relevant to this post industrial or information society also.

4.1 Institutional Knowledge

The professionals should have a clear understanding of the goals, objectives and mission of the institution. The professionals should interact with the users and deliberately spend their time with the users understanding the need and expectation of the user.

4.2 Specialist Subject Knowledge

Information professional must have thorough knowledge about the subjects and interdisciplinary research by which the knowledge is growing and be concerned with analyzing the content and assessing the relevance, and assessing the credibility.

4.3 Source Knowledge and Curiosity

With a vide variety of formats and media of the information source, information professional should possess the curiosity and exploratory thinking of using these sources of knowledge to fullest way possible.

4.4 Communicating Knowledge effectively

The skill are required in the context of presenting specialized information succinctly and clearly, as well as in the context of service promotion, i.e. bringing the services positively to the notice of those entitled to use them.

4.5 Technological Skills

These are required to use the technologies and integrate them provide a platform for the users to facilitate, browse seamlessly and navigate multiple applications in a single environment.

4.6 Legal and regulatory knowledge

These issues related Copyright Act in the digital age. There are numerous forums in which these issues are discussed meaningfully. Some of the noteworthy efforts are as follows:

(i) Skills for Knowledge Management, a briefing paper produced by consultants TFPL, on behalf of the UK's Library and Information Commission (1999)
(ii) The Council of Europe's (CoE) draft New Professional Profiles and Competencies for Information Professionals and Knowledge Workers Operating in Cultural Industries and Institutions (1998)
(iii) NJLA Professional Development Committee (1999) and
(iv) The Special Libraries Association's (SLA) Competencies for Special Librarian of the 21st Century.

According to the TFPL study competencies are "Equipping individuals and organizations to play their full role in a learning and information society". Competency as defined by the CoE document is "the set of knowledge and skills that enable an employee to orient easily in a working field and to solve problems that are linked with their professional role." This definition goes well with that of SLA having only difference that is SLA stress on the behaviour along with the knowledge and skills (Sheila, 1999). On the whole it can be said that the critical components of professional competencies are those related to theoretical foundations, societal context, ethics, adaptability, professional improvement, and professional growth within the profession as a whole.[10] These competencies make our profession indispensable to our communities, clients and constituencies.

(i) Special Library Association has come out with the report in which it emphasises on the Competencies for Information Professional of the 21st Century. Accordingly the information professionals have to have two kinds of competencies.

4.6.1 Personal Competencies: are the skills and values that enable professional to work effectively and contribute positively to

their organization, clients and profession. These competencies range from strong communicators, to demonstrating the value-add of their contributors, to remaining flexible and positive in an ever-changing environment.

4.6.2 Professional Competencies: relate to the professional knowledge of information resources, access, technology and management and the ability to use this knowledge as a basis for providing the highest quality information services. Further, there are four major competencies, each augmented with specific skills:

i. Managing information organization
ii. Managing information resources
iii. Managing information services
iv. Applying information tools and technologies

A 'Competency Management Matrix' integrates professional development opportunities with the competencies. The Matrix will enable members to track their competency development opportunities for furthering this development. Essential competencies matrix is presented in the following Table-1.

Table-1 Essential competencies matrix

Career Stage	Competencies: Professional	Competencies: Personal	Competencies: Core
Newly minted information professional	*Apply tools and technologies *Learn resources and services *Learn the organization	*Identify required skills *Learn organizational behaviours	*Continue learning * Develop ethical foundations
Advanced information professional	*Manage organizations *Manage resources * Train beginners in the application of tools and technologies	*Demonstrate value-added for contributions *Contribute to organisation, clients and professionals	*Share best practices *Train beginners in tenets of professional excellence

It is stated that, "These competencies form the basis for growth in the information age ... Although the core of the profession remains the same, the methods and tools for information delivery and the scope of the enterprise continue to grow and change dramatically. While maintaining their client and content-centered approach, practitioners increasingly require advanced knowledge of information technology to realize their full potential" (Fallis, 1999). Visualizing the growing trends in the context of technology, storage and transmission capabilities it is expected that the professionals have to have **e-competencies** along with some managerial skills, which are essential in the present context. These competencies can be enlisted as below:

(i) Have basic knowledge of the fundamental terms and functionalities of the computer
(ii) Competency with operating systems
(iii) Competency with web browsers and common web file formats
(iv) Competency with e-mail
(v) Competency with electronic catalogs
(vi) Competency with web URL's
(vii) Competency with database software
(viii) Competency with Search engines
(ix) Internet teaching/training
(x) Business and competitive intelligence
(xi) Market research
(xii) Analysis and writing
(xiii) Intranet development and management
(xiv) Consulting/advising about resources and techniques.

5. RECOMMENDATIONS

On the basis of the discussion presented above, it is felt to formulate some recommendation to be considered to sharpen the competencies skills to cope up with the changing technological scenario.

In today's digital world the information is available in a wide variety of formats. The user has little botheration about the format in which the information is available whether it may be book, journal, web sites or MP3s, etc. His only concern is easy accessibility of information. The mindset of the users is that they expect results before they could opt for any resource. Librarians need to able to reach to the future generation on their devices of choice, which operate on a wide range of standards and formats. If virtual

reference doesn't meet future generations, one should explore instant messaging or other communication technologies that allow us to deliver good quality, interactive remote information services. If library services- portals, OPACs, databases, and web sites – are not accessible on the devices beings used then we risk being irrelevant in the future world. The ability to integrate seamlessly and navigate multiple applications, simultaneously combining their worlds in a single environment is a key skill of this generation and these applications should run on all information appliances such as desktop, mobile phones, PDAs etc. There should be a vide variety of options to chose such as e-resource, audio books, etc and the library should be converted into a multimedia resource learning center by taking advantage of PC's capabilities, sound cards or speakers, web sites using animations, ability of view streaming media.

6. CONCLUSION

In the conclusion it seems better to recall the statement of Eric Hoffer who said, "In times of drastic change, it is the learners who inherit the future. The learned people usually find themselves equipped to live in a world that no longer exists" (Romanine, 2004). Libraries and information services are facing many challenges from the changes in the information environment, which is the result of proliferation of ICT's, and developments in electronic information resources. To be prepared for a future characterized by change, professionals must learn to think rationally and creatively. They should learn to solve the emerging problems, manage them to increase the productivity, quick retrieval of information, and communication capability effectively.

The roles of information and library professionals are changing and expanding as the scope of the profession broadening beyond the physical boundaries of the so called library. By mastering information solving skills, professionals will be ready for managing ably information based society as well as the technological workplace. The most critical challenge for the library professionals of today is to get ready for the future generations in which 'we are going to live rather than the one we lived so far.'

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HUMAN RESOURCE DEVELOPMENT FOR DIGITAL ENVIRONMENT FOR LIBRARIES AND INFORMATION CENTERS

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ABSTRACT

The present day technological developments in Computer and Communication have paved the way for electronic information access. Digitalization refers to the conversion of an item into Printed text, Manuscript, Image, Sound, Film and Video recording from one format usually print or analogue into Digital. Libraries and Information Centers are service organizations. Their worth is measured in terms of quality of services rendered to its Users. Libraries and Library Staff must be continuously updated with knowledge and skills in the areas of information resources, tools, access, models, technology management & research and the capability to integrate all these for providing efficient and effective library and information services. This paper raises issues particularly Human Resources faced by Indian Libraries in various stages of transformation. This paper highlights the problems faced by libraries in modernizing their libraries and digitizing their collection. The paper emphasis the HRD in Indian scenario and also some aspects of HRD that might help library and information to contribute substantially their share to support professional education and training institutions should also share responsibilities in conducing research in HRD.

LIBRARY MANAGEMENT WITH SIMPLE SKILLS FOR PROFESSIONAL EXCELLENCE IN DIGITAL ERA

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ABSTRACT

Training is to concern goal, goal is to certain success, and the success is depending completeness in the work. Success and completeness in the works are depending continues struggle in related work. For this achievements, and proof of this concept, here is a sentence by the successive man in the spiritual demonstration, Swami Vivekananda. "Purity, patience and perseverance are the three essentials to success". Success is nothing but an excellence; it is concerns to all good wills of the productive people. This extraordinary achieve, managers of the unit (information center) must need to know the importance of unity and intimacy between the working group to expect the quantitative service with Proper dedication that as usual.

Output and its quantity with quality and completeness in utilization of resource to providing good out put, every thing is depending on effective utilization of infrastructure including manpower. To minimize the expense and maximize the output, managing skills are must to traditional information managers (Librarian). Especially to information management in the environment of advanced technological tool and highly flexible / sophisticated manpower, some soft skills to be need to handle them accordingly .The paper emphasizes the soft skills which are very common like communication, psychic preparation, motivation, ethical standard and charity in the profession are explained with the basis of personal experience.

THE PHENOMENON OF KNOWLEDGE MANAGEMENT, HUMAN RESOURCE DEVELOPMENT AND CORE COMPETENCIES AMONG LIBRARY AND INFORMATION SCIENCE PROFESSIONALS

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ABSTRACT

Knowledge management is the key factor in the development of human society. It enhances the organizations ability and capacity in four dimensions viz. mission, competition, performance and change. Knowledge Management is the process of transforming information and intellectual assets into enduring value. It connects people with the knowledge that the need to take action when they need it. Knowledge management is a discipline that promotes an integrated approach to identifying, managing and sharing organizations information assets, including databases, policies and procedures as well as unarticulated expertise and experience resident in individual workers. The paper discusses about the Knowledge and its types, concept and definitions of KM, and describes its principles. Also explain the importance of Human Resource Development (HRD) in the context of library, and core competencies between Library and information Science professionals (LIS). Some of the steps in KM and core process are also illustrated along with tools and technologies used in KM.

DEVELOPMENT OF HUMAN RESOURCES IN LIBRARY AND INFORMATION CENTRES THROUGH RE-ENGINEERING

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ABSTRACT

Human resources are perhaps the most valuable and the cheapest assets in the hands of organizations. These are the assets, which are used for operating all other assets for the creation of value-added. Sufficient attention has been constantly and continuously paid to the development of human resources. The concept of human resource development is comparatively recent origin. It means developing or tapping hidden qualities in people in order to make them accomplish new functions leading to organizational and individual goals. Really it is a process by which the employees of an organization are helped in a continuous planned way to improve their capabilities through skill and knowledge improvements and behavioural and attitudinal changes according to the needs of the organizational set up. Re-engineering means the radical redesign of work to achieve substantial improvements in performance. Re-engineering searches for the most efficient way to perform a large task. In re-engineering, work is organized horizontally rather than vertically. The people in charge of the process function as team leaders also guide the team towards completion of a core process key performance objectives for the team would include reduce "cycle time" – reduce costs and reduce through put time. The paper presents the development of human resources in library and information centers and concludes redesign of work systems in libraries through re-engineering.

HUMAN RESOURCE DEVELOPMENT IN LIBRARIES IN CHANGING SCENARIO

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ABSTRACT

The paper discusses the aims, objectives and need for Human Resource Development (HRD) and recognizes human resource as the most potential resource for development. Various mechanisms of HRD such as -- motivation, performance evaluation, in-service training, Total Quality Management (TQM) have been discussed. The paper emphasizes that in order to meet the challenges of information explosion and communication technology, the library staff should be trained to get themselves abreast with the latest information in the profession.

1. INTRODUCTION

Human being as a resource has been realized since time immemorial particularly during the last two decades. Human resource is the process of developing the skilled manpower. It has become a challenging task in each and every organization not only to maintain a workforce that is both content and predictive but also to recognize the workers' expectations of meaningful situation. It is an indispensable factor for the survival of the organization. Efficiency and effectiveness of an organization depends upon the competence of the staff working in it and their knowledge, skills and attitude towards their profession. No organization can render desirable services without the adequate and competent, qualified and skilled staff. Human resources not capital, not income, nor material resources constitute the ultimate basis for the wealth of nations maintains. Human Resource Development (HRD) is an integral part of any organization and is necessary to achieve the goals and objectives of that organization.

2. HRD IN LIBRARIES IN CHANGING SCENARIO

Human Resource – The work force – is a crucial element for the success of any organization and so also in library and Information Centres (LICs). In the changing library environment coupled with the fast emergence of information technology, the concept of libraries as storehouses and librarians as custodians has been changed to the idea of information management centres and information managers / disseminators respectively. The information explosion and proliferation of published literature, the advent of computers and communication technology have brought tremendous change in the information handling management and has made the job of library professionals more and more challenging. The library staff can face this challenge only if it is mentally prepared and also trained to do so. The libraries modernizing their services, adopting the new information technology must pay special attention to the development of their staff. Efficiency and effectiveness of a library largely depends upon the proficiency and competence of its staff. Well-motivated persons with good academic and professional qualifications, innovative capability, managerial ability is sure to contribute towards the success of a library.

3. AIMS OF HRD

HRD should aim:

(i) To develop professionals for assuming broader role of providing effective information to users;
(ii) To impart knowledge, skills and attitudes to L and IS personnel which would contribute to productive and development programmes through effective information handling techniques;
(iii) To enhance the aspirations and capabilities of the staff;
(iv) To initiate and support in-service training and continuing education;
(v) To help the placement of the right professionals at the right place;
(vi) To facilitate healthy working conditions;
(vii) To develop adequate staff;
(viii) To create cordial staff relations.

4. MECHANISMS OF HRD

Mechanisms of HRD include:

4.1 Performance Evaluation

Performance evaluation is a process of quality assurance whereby an approved institution, personnel or a programme is critically appraised at regular intervals as to confirm whether an individual meets the norms and standards prescribed by the institution from time to time. It is given an elaborate importance in personnel management of today's scenario, wherein; Internet, networking, globalization etc. are taking deeper roots in our country. To improve the performance of library and particular the performance of individual members of the staff, performance evaluation takes a front seat. This incorporates the discovery of training need, the motivation of staff counseling, shaping behaviors by praise or punishment. Performance evaluation also helps in predicting the level and type of work the individual will be capable of performing in future and to adjust with the changing environment of modern information technology. Tools used in evaluation are:

(i) Questionnaires / Appraisal forms
(ii) Interviews
(iii) Performance appraisal sheets
(iv) Tests and evaluation against variable objectives

Criteria for evaluation of librarians include:

(i) Teaching and research performance
(ii) Educational attainments
(iii) Administrative experience
(iv) Professional interests
(v) Individual personality
(vi) Outstanding achievements

Performance evaluation ensures the library that it has the right people carrying out their functions effectively and efficiently. Potentialities and capabilities by individuals are recognized for entrusting them with higher authorities and responsibilities. An individual can also get an idea of what is expected of him, so that he will have an opportunity to improve himself.

4.2 Motivation

Motivation plays an important role in creating an environment conductive to a desired performance. Motivation is a term which is generally used to apply to the entire class of drives, desires, needs, wishes and similar forces which channelises individual and

group behaviour for the achievement of individual and organizational goal. Library managers must apply motivational methods for increasing job satisfaction of library staff for achieving the desired goal. Various types of library jobs must be motivating to the employees attending them. Jobs must be redesigned and enriched with dimensions like variety, autonomy, task identity, task significance, feed back, job-rotation, etc. The library manager has to find out the individuals ability, skill and interest of library staff. Motivational methods like appraisal, rewarding could be employed in libraries. In order to have good public relations, the feed back of a user is relevant and useful which will help in healthy user relations. Library staff should be motivated to attend various conferences, seminars, workshops, etc. in order to get exposure to new developments in the profession. They should be encouraged to write and present papers in the seminars and conferences. To encourage the staff several motivating factors are employed. These include:

(i) Setting sufficiently challenging goals that inspire a sense of commitment among employees.
(ii) Genuine appreciation and encouragement of good work done
(iii) Creation of wider opportunities for self improvement and participation in decision making
(iv) Arousing the feeling of achievement
(v) Lessening anxiety
(vi) Job enrichment

4.3 In-Servicing Training

Training is a process of learning, which is structured to impart and develop knowledge, skills and attitude in employees. In-service training can be defined as a process of acquiring and transmitting professional knowledge and practical skills during working life.

Training gives an employee confidence in handling the job assigned to him to increase the quantity of output through improved work, methods and skills in employee trained on the job through various training programmes to enhance, develop and update their skills and knowledge.

To provide training to library professionals a number of short-term courses, refresher courses, workshops, etc. are being organized in the country by different organizations. Various programmes of in-service training should be organized in such a manner that all

the professional staff members are trained in rotation for various activities going in the library. In order to get acquainted with library automation being undertaken these days, each and every professional in libraries should be trained in handling the computers in the library work. Constantly changing techniques for the effective use of libraries and information centres necessitates the reorientation of librarians and information scientists from time to time.

5. TOTAL QUALITY MANAGEMENT

Total quality management (TQM) is relatively a recent management concept wherein quality is the driving force of the entire activity cycle from beginning to end. It is a customer-oriented and quality focused philosophy. In modern libraries, the value added information service can only provide the conformance to the requirements of the users and users satisfaction. The value added service can only be achieved by implementation of TQM principles in libraries. For achieving total quality for the system, the library managers have to understand the core concepts of TQM themselves and have to be trained in this philosophy and technique. TQM can be effective only when the employees feel involved in every step and in the responsibility of the organization. Management has to create an environment for attitudinal change in staff. The focus must always be on keeping each and every employee involved to the best of his / her ability in satisfying the customer and in improving their performance. Professionals should have sufficient autonomy to work freely on their own initiative. They should be able to make use of their intelligence and to think about their work. TQM does not require doing different things but simply requires doing things differently.

6. CONCLUSION

Present libraries are passing through an exciting phase of transformation under the impact of information technology. It is imperative to equip human resources with all the needed knowledge, skills and capabilities to handle the information technology and other changes in the field with greater motivation and commitment. Enthusiasm for IT applications among the library professionals can be infused only through training programmes. They should be provided adequate opportunity for continuing professional education. The parent organizations should motivate their staff to attend various conferences, seminars, symposia and the workshops so that they may interact with the experts and get

latest information in the profession and update their knowledge. For effective and smooth functioning of a library, an environment conductive to work as well as for the development of good interpersonal relationships should be created. The relations between the super-ordinates, superiors, equal and subordinates should be cordial and smooth. The essential task of management is to arrange organizational conditions and methods of operations so that people can achieve their goals best by directing their own efforts towards organizational objectives.

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HUMAN RESOURCE DEVELOPMENT: KNOWLEDGE, SKILLS AND QUALITIES

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ABSTRACT

The paper describes about the Human Resource Development in social terms, economic, political terms, and organizational terms. Its benefits and also briefly describes about HRD meaning and concept and its impact in an organization, in an individual and by self-efforts. Mentioned in brief tips of knowledge, skills and qualities that are essentially required in Library professional for to be always practically successful at their workplaces in new information technology environment, and also describes some important professional competencies as per situation which are explained with practical approaches.

1. INTRODUCTION

Information Technology (IT) is a great leveler, has helped enhance productivity and boost profitability. Advances in technology have changed the way we live, work and it has made the world a better place to live. Significantly, the technology revolution has also reoriented the Human Resource (HR) function and got it up-to-speed. Traditionally, HR's primary responsibility was to nurture the IT intellectual capital, Typically, HR operated in the space of recruitment – training rewards- retention. Today, HR is the key custodian of an organization's intellectual resources. With the advent of tech waves and sky-high stakes, it has become imperative for HR to be pro-active and perform a quasi-strategic function.

1.1 Concept and Meaning of Human Resource Development

Human Resource Development (HRD) refers to the relationship of own-self and with organization/society.

- HRD also refers to factors in the individual, which determine personal satisfaction (Factors in the personality of the individual) social attitude and Professional skills.
- Cognitive abilities - intelligence
- Acquired / personal abilities – rationality / work commitment.
- Social attitudes – Unselfish concern for the welfare of others/consumerism
- Work competence – Skills / Creativity

1.2 HRD is Social terms

HRD is a process of modernization an enable people to lead fuller and richer lives. Therefore, education is considered as an ingredient and an instrument of HRD.

1.3 HRD in economic terms

HRD is accumulation of human capital, its effective investment in the development of an economy. Economist refers to HRD as a process of increasing the knowledge/ skills/ capabilities of all the people in the society.

1.4 HRD in political terms

HRD is process of preparing people for effective participation in the political process.

1.5 HRD in organization

1. Training programs in employing organizations.
2. Adult education programs
3. Life long learning beyond walls.
4. Activities of various groups/organizations/Social/cultural
5. Yoga for Transformation to man to universal man

2. KNOWLEDGE, SKILLS AND QUALITIES

2.1 Knowledge

- Of course, to be well aware of Knowledge about their work field/Job & continuous updating of existing knowledge of their job.

- Fact about the parent organization, including its aims & objectives, source of funding, staff structure and financial position.
- Fact about the department itself, including its values, mission, aims and objectives, strength, weakness and relationship with its parent organization
- Fact about department's external environment, including trends in their departments and world at large
- The conditions, which help to ensure success change in department, including flexible staff structure, effective human resource system and change, oriented cultures.
- Tools and techniques, including methods for environmental analysis, planning analysis, planning decision making, managing projects, self development and coping with stress.

2.2 Abilities and Skills

In order to manage their job well, staff must have number of innate abilities & continually developing skills, as follows:

(a) An ability to communicate effectively & to develop skills in
- Listening actively
- Presenting information orally & in writing
- Negotiating with fact and diplomacy
- Working in groups
- Participating in meetings
- Giving constructive feedback objectively, accurately and succinctly

(b) An ability to make decisions using both logic and intuition, specific decisions making skills includes:
- Gathering and analyzing data
- Generating ideas
- Assessing risks

In addition to the skills above, staff should have following too.

- Team building skill
- Project management skill
- Time management skill
- An ability to summaries ideas and test assumptions

2.3 Personal qualities

As well as knowledge and abilities, successful staff should also have personal qualities that help them manage their job successfully, these includes

(i) Continuing sensitivity to events, circumstances and feelings

(ii) Adaptability, including a willingness to switch from one activity to another and to take risks

(iii) Proactively, which requires an ability to understand the broad change and willingness to take initiative and find a way forward

(iv) Creativity, which enables them to respond in new ways to changing circumstances

(v) Emotional resilience, including an ability to cope with in uncertainty, pressure, deadlines, conflicts and complexity

(vi) A positive attitude towards self development

(vii) Self-knowledge and an understanding of personal values, strengths, weakness and learning styles.

Table-1 presents some important professional competencies as per situation required in research libraries.

Table-1 Some important professional competencies as per situation required in research libraries

S. No.	Tips/Situation	Practical approach
1	Expert knowledge of the content of information resources, including the ability to critically evaluates and filters them.	Evaluates and selects key information resources, print and electronic, for a small Research center/Special libraries etc.
2	Specialized subject knowledge appropriate to the organization users.	Maintains a view of the organization's research interest by reading core journals and other key sources etc.
3.	Develops and manages convenient, accessible and cost-effective information services that are aligned with the strategic directions of the organization..	Develops a strategic plan linked to the aims/objectives of the organization. Builds an effective staff team to manage information services etc.

4.	Provides excellent instruction and support for library and information service users.	Teaches Internet courses for employees by users orientation program. Provides online reference and assistance etc.
5.	Assesses information needs and designs and markets value-added information services and products to meet identified needs.	Conducts regular needs assessments using research tools such as questionnaires, focus groups and key informant interviews etc.
6.	Uses appropriate information technology to acquire, organize and disseminate information	Creates an online catalog of the library collection, maintain Electronic /online journals homepage with regular updating links etc. as http://www.iucaa.ernet.in/~library/Online.html
7.	Develops specialized information products for use inside or outside the organization or by individual users	Creates databases of in-house documents such as reports, technical manuals or resource materials used for special projects etc. as http://www.iucaa.ernet.in/~library/yearwise.htm
8.	Evaluates the outcomes of information use and conducts research related to the solution of information management problems	Gathers data related to needs assessment, program planning and evaluation. Participates in research projects et
9.	Continually improves information services in response to the changing needs.	Monitors organization's trends and disseminates information to key people in the centre or to individual user etc.

3. CONCLUSION

No organization can function efficiently without appropriate Human Resources and Library and Information Service Centres are not an exception. To use this resource effectively, careful planning, analysis and development and attention are necessary. Above said are some of the professional competencies of special librarians for the 21st century. They have their roots in the past, but they reach far into the future. Special librarians recognize the expanding nature of the challenges that face them in the information age and the range of competencies that are required

to meet them. The challenges represented by these competencies must be seized and acted upon today in order to ensure that special librarians have a viable tomorrow.

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HUMAN RESOURCE IN LIBRARIES: NEW DIMENSIONS

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ABSTRACT

Human Resource (HR) can be an enormously paper-intensive process but the technology triggered a revolution in what HR managers do and how they do it. The process of integrating technology into libraries has added a new dimension to our understanding. The computer and related technologies can also be used to facilities or improve management as well as HR. This article presents a glimpse of the probable uses of Information Technology (IT) in the HR management because as technology in such areas as recruiting, testing and interviewing began to emerge, the personal department began to play an expanded role in employee selection, training and promotion. And all these will assist HR managers in their work.

1. INTRODUCTION

It is not possible to build a digital future properly from a traditional organization environment with its closely related logistic processes. Libraries are still concentrating on using automation to replicate and enhance previously manual tasks. It means that it has not had much effect in improving the overall management of the library.

In some measure, we have crammed automation down the throats of library patrons as a by-product of technical services activities, although with very good intentions. But we have now begun to take hold of events and consciously and deliberately start shaping

automation to the human needs. That's why we have to leave behind an organization in which processes take place, subdivided into parts via various departments. We have to aim at working in integrated teams that are responsible for aspects like TQM. In such teams, knowledge of traditional library should be completely integrated with new aspects such as information technology and marketing.

2. REENGINEERING HRD IN DIGITAL ENVIRONMENT

The library and the library profession are going through a period of considerable change. In this environment the managers of libraries (librarian's) must be flexible in attitude to keep pace with and adapt to dramatic changes in the library itself and in the technological and social environments in which it operates. As it is mentioned earlier that majority of the functions of the libraries are automated till now or going to be automated very soon but still an aspect remains untouched, that is Human Resource Development (HRD). Unlike other organizations libraries are still not Recruiting, Selecting, Testing, Interviewing its staff by the help of IT.

It is said that in the past, library leaders asked how to use technology to accomplish existing tasks such as circulation and cataloguing. Now the library leaders ask how technology can accomplish something to tally new. It is generally agreed that the library manager of today needs rather different skills from the managers of yesterday, and perhaps greater managerial sophistication. The manager needs to be visionary and able to provide true leadership. It is essential in order to foster innovation and to ensure that the competencies of staff members are the competencies needed today, and these can be easily gained with the help of IT in HRD.

3. BENEFITS OF USING IT IN HRD

- It seems widely accepted within the library profession that automation has improved job satisfaction and the self-image of the professionals.
- Another reason is that this will improve their image with library users and perhaps eventually increase their status within the communities served.
- Their job (HRD managers) became more interesting as a result of automation.
- It will make decision making easy.

- It will reduce the workload of the persons involved in HRD.
- It will economize the procedure.
- It will give a hi-tech look to the library and attract more and more technology savy professionals towards the library.
- This practice will bring libraries at par with other organization implementing IT.
- It will ensure better and quality supply of human resources.
- It will also help in updating the existing staff.
- At last IT is always referred to be as a time saving tool and to get rid of present cumber some practices. It collects better data to aid overall management of the library.

4. AREAS OF IMPLEMENTING IT IN HRD

Trends like globalization and technological innovation are changing the way libraries are managed. Libraries today must grapple with revolutionary trends: accelerating product and technological change globalize competition and trends toward a service society and the information age. That's why for responding to these challenges, new modes of organizing and managing have emerged. For example: The automated library tends to make more use of a matrix organization of temporary structures, such as task forces or project groups, causing blurring of divisional or departmental boundaries.

Not surprisingly, the role of HRD is also changing, to adapt to these trends. Changes like these mean that organizations must depend more on self-disciplined and highly committed employees and this need is fulfilled by adopting IT in HRD in the Following areas:

4.1 Computerized Skills Inventories

One-way to improve the likelihood that qualified internal candidates will be introduced into the selection process is to have a computerized skills inventory completed and updated regularly by employees. Then the HR department can help to match good internal applicants with job openings. Inventories should be regularly updated when an employee has computed a course, seminar, workshop or assignment that is applicable. When a vacancy occurs, interviewers would specify the parameters of the

job based on the job analysis in terms of the skill categories and levels. A computer program would then produce a list of employees who qualify according to these parameters. This list would be modified based on other factors such as attendance, quality of performance, time in position, or interest of the candidate. Developing a skills inventory system with significant employee input, active encouragement to update, and results that keep employees informed of promotional possibilities will enhance retention.

4.2 Using the Internet for writing Job Descriptions

Most employers probably still write their own job descriptions, but more are turning to the Internet. One Side www.jobdescription.com illustrates why. The process is simple search by alphabetical title, keyword for that title etc.

4.3 Recruiting on the Internet

Computers are playing a bigger and bigger role in helping employers recruit employees today. Computer applications range from recruiting on the Internet to automatically scanning and storing applicants resume. Trends in recruiting are of using the Internet, the World Wide Web (WWW) and commercial on-line services like CompuServe. online career center is also an alternative. Some recruiting Web sites are:

- American's job Bank
- Career Builder
- Career Mosaic
- careershop.com
- dice.com
- employment.com
- Job options
- jobs.com
- jobtrak.com
- monster.com

4.4 Computer – Interactive performance test

Microprocessors and mini computers have opened up new possibilities for measuring various types of performance. The first use of computer is to administer a currently available printed test. Using the computer in this way facilitates scoring and the

compilation of cumulative norms. A second way in which computers are used today in selection testing may be called the adaptive test. Adaptive tests automatically tailor a sequence of test items to each examinee, contingent on his or her responses to earlier items in the sequence. Third, computers are being used to enhance the administration of tests when dynamics are involved, as in tests of perceptual speed. Fourth, Computers are being used to measure human capabilities not easily measurable by printed tests. For example, measuring capabilities like the ability to function under different time pressure, or under different work load conditions or the ability to concentrate under stress are not human capabilities easily used in this area, for instance by measuring the person's ability to concentrate as various stimuli are projected on the screen.

4.5 Computerized Interviews

Today, it's often computers, not people that administer the interview. A computer selection interview is one in which a job candidate's oral and/or computerized response are obtained in response to computerized oral, visual or written questions and/or situations. Most present the applicant with a series of specific questions regarding his or her background, experience, education, skills, knowledge and work attitudes that relate to the job for which the person has applied. Other, video-based computerized interviews may also comfort candidates.

Typical computerized interviews present questions in a multiple-choice format, one at a time; the applicant is expected to respond to the questions on the screen by pressing a key. Questions in a computerized interview come in rapid sequence and require the applicant to concentrate. The typical computerized interview program measures the response time to each question. Computer aided interviews are generally used to reject unacceptable candidates and to select those who will move on to face-to-face interviews.

Computer aided interviews can be advantages. Applicants are reportedly more honest with computers than they would be with people, presumably because computers aren't judgmental. The computer can also be sneaky, if an applicant takes longer than average to answer certain questions, he or she may be summarily screened out or at least questioned more deeply in that area by a human interviewer.

4.6 Training Via the technology

On the one hand, technology has provided the tools to make instruction more effective and more interesting on the other, the continuing and rapid introduction of new technologies into the library itself places significant further demands on those staff members directly involved in instructional programs. Networking and computer assisted instruction courses have transformed the classroom from a mere physical environment to a virtual learning environment. Self paced instruction software and Internet Chat forum or listservs are how used to teach basic information.

While it's still in its infancy, training on the Internet is already a reality and there seems no doubt that libraries will soon be relying on the Internet to offer at least some of their training programs. At the present time, most Internet training programs are aimed at teaching Internet users how to use the Internet. In many ways the course is like a correspondence course that lands in user's E-mail boxes.

Similarly a new method is also used "Electronic performance support systems (EPSS)." It is said that people don't remember everything they learn. The same applies to training. EPSS are today's job aids. They are set of computerized tools and displays that automate training, documentation, and phone support, integrate this automation into applications and provide support that's faster, cheaper and more effective than the traditional methods.

In this way with computer-based training, the trainee uses computer based and/or CD-Rom systems to interactivity increase his or her knowledge or skills. The program consists of graphics-supported lessons, and requires trainees to make choices to show their understanding. The staff needs training on the following equipment:

- Learn how to operate equipment;
- Keep informed of ongoing technology developments;
- Learn how to develop databases for organizing and storing information;
- Anticipate user needs.

At last it is added in this context that staff is a library's single most expensive resource and should be treated that way. Any

investment made in retooling staff skills to meet the challenges and opportunities of the electronic age will be repaid many times over in better service to clientele and a vital and engaged workforce.

5. INFORMATION TECHNOLOGY AND ATTITUDE SURVEYS

Many organizations today rely on attitude surveys to monitor how employees feel about working in their organization. Computerization of surveys can provide anonymity. Survey software packages are available that generate questions for a number of standard topics and can be customized by modifying existing questions or by adding questions. If the survey is computerized, then report can be generated with ease to provide snapshots of a given period of time, trend analysis and breakdowns according to various demographics. Age sex, job categories, departments, divisions and functions etc may interest one in responses. The survey can be conducted by placing microcomputers in several locations convenient for employee use.

It is the trend in HR that now employees who are leaving the company are often asked their opinions during a formal or informal exit interview. Concerned about future references, employees often state innocuous reasons for leaving, reasons know to be acceptable to the company. However, if the exiting employees build respond to computer questions (Such as, "If you could change some aspect of organization, what would it be?" If you would change some aspect of our benefits, what would it be?) And be assured that answers would not be looked at until several people had responded, more helpful information might be learned.

6. COMPUTERIZED PERFORMANCE APPRAISALS

More employers are turning to computerized performance appraisal systems today, generally with good results. Several relatively inexpensive performance appraisal software programs are in the market, including Employer Appraiser, Review write and Performance Now. All three enable managers to log notes on their subordinates during the year, and to rate employees on a series of performance traits. The program generates written text to support each part of the appraisal. Employee Appraiser presents a menu of more than a dozen evaluation dimensions, including dependability, initiative, communication, decision-making, leadership, judgment and planning and productivity. Within each dimension are various performance factors again presented in

menu form? Performance Review.Com from knowledge point of Petaluma, California lets managers evaluate employees online. Managers can choose from standard competencies such as "Communication" or create their own. Performance Pro.net from the exceed company of Chicago, Illinois, is another Internet based performance review system. It helps the manager and his or her subordinates develop performance objectives for the employee and conduct the annual review. The Web Site improves now. Com lets employees fill out a 60 questions assessment online with or without their supervisor's approval, and then gives the supervisor the team's feedback with an overall score. Electric Performance Monitoring (EPM) is in some respects the ultimate in computerized appraising. EPM means having supervisors electronically monitor the amount of computerized data an employee is processing per day, and thereby his/her performance.

7. COMPUTERS AND BENEFITS ADMINISTRATION

Whether it is flexible benefits or some other plan, computers play an important role in benefits administration. PC-based system let employee's interactivity update and manipulates their benefits packages, as do various Web sites like www.40lk.com. Inter and intranet systems enable employees to get medical information about hospitals and doctors and to do interactive financial planning and investment modeling. Organization also uses computerized systems to inform employees about their benefits and to answer routine questions that might otherwise go unasked or take up a human resource manager's time.

Organization wants to control benefits costs. One prerequisite is to be fully aware of how much the benefits offered are actually costing the organization on an ongoing basis. A benefits spreadsheet will provide this information.

8. CONCLUSION

Making the libraries more responsive to product innovations and technological change is the basic aim of the professional. HR plays a crucial role in service organization like libraries. So progressive HR practices build employee commitment and morale; employees will then provide excellent user service, which in turn will generate user satisfaction. At last it is say "People are behind success. Machines don't have new ideas solve problems, or grasp opportunities. Only people who are involved and thinking

can make a difference but they are supplemented by technology in doing their work."

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IMPROVING SKILLS IN ACCESSING SOCIAL SCIENCE INFORMATION IN DIGITAL ERA: ROLE OF NATIONAL SOCIAL SCIENCE DOCUMENTATION CENTRE (NASSDOC)

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ABSTRACT

The use of information and communication technologies has brought drastic changes in the traditional methods of information storage, retrieval and its dissemination. To meet the new challenges present paper describes the need, importance, design and planning of In-service training programs for library and information scientists and social scientists. Based on the feedback received from the participants, participated in NASSDOC supported short-term training workshops, critically evaluate these training workshops and suggests various ways to improve these. Also highlights the need of preparing teaching/education kits in the form of multimedia packages for upgrading the skills of both information intermediaries and users of social science information in accessing information, documents and data available in digital and other format. Study is based on the practical experience of organizing In - service training workshops under "NASSDOC CONTINUING EDUCATION PROGRAM"

"Learning is a continuos process. In- service training is an integral component in the continuing education of the member of any profession in society".

1. INTRODUCTION

The recent developments in the field of Information and Communication Technology (ICT) have changed the techniques of information acquiring, storing and dissemination. Computers have revolutionized management of information in relation to speed, efficiency and effectiveness. In addition, computers to gather with

ICT have altered the ways in which information is collected, stored and transmitted. In last 30 years computers have replaced manual methods of information storage and retrieval. Now the concept of 'library without walls' has almost become a reality because of ICT.

Libraries are facing unprecedented challenges as each new wave of technology allows new changes in the expanding world of information. In order to cope with the new challenges, needs and demands, librarians or information intermediaries must begin acquiring those skills that will allow libraries to continue to meet the information needs of their end-users. Library professionals must strive to remain competent navigators of each medium of in order to assist library users. The complexity of information processing and storage systems increases with each new technology introduced and librarians are forced to attempt to keep up with these changes.

Usually, librarians have completed their training before they entered into profession. They are familiar with the sources and services, which were available at that time. They lack some of the necessary skills and competencies needed for modern information management and administration. In the present era it is beyond the working capacity of any librarian to cater & satisfy the information needs of end users with out using ICT. A good amount of information sources are now available on the Internet and are in digitised formats. In the digital era, it is also essential on the part of the information users to familiarise themselves with the developments in the field of information technology and improve their skills in accessing information by using various sources available in different formats.

Therefore it is imperative that the information centres, research organizations, library networks and library schools should focus their attention to expose the potential users of information to the latest information technologies and also provide regular short term training to make best use of information and communication technology in searching for information. Recognising the need of users of social science information and of the information intermediaries the NASSDOC has a regular programme for organising short term training workshops.

National Social Science Documentation Centre (NASSDOC) was established in 1970 by Indian Council of Social Science Research (ICSSR) to provide information support for quality research work

in Social Sciences. NASSDOC is a documentation unit of ICSSR and main mandate of NASSDOC is to provide full range of documentation and information services in the field of social science. In order to keep in touch with the latest developments and to develop specialised skills in accessing social science information, NASSDOC organises short-term-training workshops under its 'NASSDOC Continuing Education Program', on regular basis for over 20 years. These training workshops provide an easy way to refine and upgrade the information locating skills of information professionals, researchers and others working in academia, business and government. These training courses are constantly improved using feedback from the participants and the resource persons.

1.1 Objectives of the study

The basic purpose of this program is:

(i) To create awareness among end-users of social science information and information providers about latest ICT using in accessing social science information;
(ii) To provide practical experience of latest information sources;
(iii) To update information skills for exploiting new systems and resources pertaining to social sciences.

1.2 Methodology of the study

The methodology used for this purpose consists of :

(i) Lectures
(ii) Demonstrations
(iii) Presentations, Discussions
(iv) Study tour of major information centres and libraries and
(v) Hands-on-experience

A major percentage of time in these workshops is devoted to hands-on-experience.

1.3 Participants

One of the uniqueness of these workshops is that these are not exclusively meant for information providers or for information

users. In these workshops participants are combination of: social scientists, librarians, information intermediaries, computer professionals, university and college professors, readers, research scholars, managers, and policy makers. Even in some of the workshops chief medical officers, looking after the social work programs and IPS officers at the rank of D.I.G. were also among the participants. Till date about 1000 participants participated in these training workshops.

1.4 Course content

A special care is being taken in developing the course contents for these workshops. The techniques used for this purpose in these in-service- training courses were developed in accordance with the present socio-economic situation of the geographical region of the participants and their levels corresponding to the mentality and motivation of different target groups. Taking into consideration NASSDOC workshops are designed for 2 levels. Level one - is designed to introduce the participants to the rapidly changing social science information scenario. It is basically for beginners and those who have little exposure of information technology in accessing information.

Level two is for the participants, who exposed to some extent in the information and communication technology but want to improve their information seeking skills.

Programme Contents for these Training Workshops are like:

Use of Information and communication Technology in social sciences

(i) Introduction to social science information with special reference to Development Information
(ii) Impact of Internet on its users
(iii) Information centres and library networks
(iv) CD-ROM databases for social sciences
(v) Search tools and techniques-Directories, search engines and others
(vi) Major websites: Indian and International.
(vii) Criteria for evaluation of Internet Resources
(viii) Social Science Information
(ix) Subject Gateways

The hands on experience like practice in the use of computers and locating information, searching Internet or other information sources is considered to be an indispensable part of their information skills training and a major portion of time is devoted for this purpose.

2. COLLABORATORS/PARTNERS

ICSSR has a network of 6 regional centres and 27 research institutes. NASSDOC organised training workshops in collaboration of these regional centres and research institutes located in various parts of the country, viz. Mumbai, Ujjain, Hyderabad, Shillong, Chandigarh, Bhubneshwar, New Delhi etc. Apart from this NASSDOC also collaborates with other information centres, universities, research organisations and library networks for organising these workshops.

At international level, NASSDOC has been collaborated with UNESCO, APINESS- Asia Pacific Information Networks and the Netherlands Foundation for the Advancement of Tropical Research, The Hague (WOTRO). NASSDOC has organised approximately 38 workshops in last 20 years.

3. FINANCE

Registration fee is very nominal. In our country due to financial crunch not everybody interested may participate. In order to open possibilities for a greater number of participants to raise their professional skills in some of the workshops registration fee is waive off.

These are fully sponsored by ICSSR-NASSDOC.

4. RESOURCE PERSONS

Resource persons for these workshops, from the region were always found quite useful because they understand the information needs of the area in a better way. NASSDOC careful selects the resource persons for these workshops. From time to time NASSDOC has coopted and invited experts in their areas of specialisation from all over the country and even invited experts from other countries and organizations like UNESCO, British Council, University of Bath, and University of Bristol, UK etc.

5. FEEDBACK

In order to improve the contents of this program, we at NASSDOC invariably received feedback from the participants. After the workshops are over each participant has to fill up a Participant's Overall Evaluation Sheet. A copy of the same is enclosed at appendix '1'. General remarks and suggestions given by the participants are:

(i) Participants found the training workshops relevant for meeting their training needs.

(ii) Theoretical sessions were very informative, educative and well planned.

(iii) Course material provided by the organisers was found to be very relevant and adequate by the participants.

(iv) They found the resource persons very informative and knowledgeable in their area of competence.

(v) Guidance from the resource persons was found quite useful. The resource persons were very cooperative and helpful to the participants especially during the practical/ hands on sessions.

Some of the suggestions given by the participants after participating in these workshops were:

(i) More time may be given on practice/hands-on-sessions.

(ii) Similar workshops may be organised on a more frequent basis at other places in India.

(iii) Workshops should be held on specific themes.

(iv) Participants should be provided financial assistance by the funding agencies for attending these workshops

Participants looked to be very satisfied as some of the university teachers and researcher scholars got substantial social science research material on the topic of their interests from the searches they made in CD-ROM Databases and in the Internet.

Most of the participants appreciated the efforts of NASSDOC and the ICSSR in this direction. They were of the view that these programmes were well organised, designed and planned.

After completion of the workshop, each participant receives a certificate.

6. CONCLUSION

In service training workshops are the most popular ways of improving skills of a person. Any organization, libraries or information centres in particular, should be able to understand the significance of the in-service-training program. They should allocate adequate finances in their budget for the staff working in their organization for this purpose.

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Appendix 1

PARTICIPANT 'S OVERALL EVALUATION

In order to improve the content of the programme, we will appreciate receiving your feedback. You need not reveal your identity, if you so like. Tick (√) appropriate statement.

1. Did you find the workshop academically satisfactory?
   Fully satisfied □ somewhat satisfied □ Dissatisfied □

2. To what extent the practicals were helpful?
   Very helpful □ somewhat helpful □ Not at all helpful □

3. What are your observations on the duration of program?
   Too short □ Too long □ Just right □

4. Specifically indicate what aspects of the workshop were of special interest to you:

5. Indicate the topics in this program which would have been most relevant to you but not included in the current workshop:

6. Indicate the topics, which were least relevant and could be safely omitted:

7. Were the arrangements made for your stay and for boarding satisfactory?
   Satisfactory □ Tolerable □ Not satisfactory

   If not satisfactory please specify reasons:

8. What was your source of information about this workshop.

9. Any suggestions about topics on which ICSSR may organise such training workshops in future:

10. Any other suggestion about the program:

LIBRARIANSHIP IN DIGITAL AGE: TRADITION V/S TECHNOLOGY

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ABSTRACT

As the world moves with technological advancement libraries have to become increasingly electronic. With all these technological advancement the library is making very positive stride to keep up with our changing society. However, in an increasingly electronic and technological based society it is a struggle to maintain any traditional institutions like library. Everyone still today likes to curl up with good books and no matter what technological advances is made; one cannot curl up with good computer. But there has to be a willingness and ability among our professionals to change procedure and method to suit the new resources and to adopt/implement new techniques by enhancing our ability to utilize information in electronic format on high-speed networks. We must make it sure that we can develop a vision for our libraries future in the internet-enabled society and define its role in facing new frontier. The paper examines and outlines basic need for adopting this changing dilemma in context of human, service and organization and critically evaluates many professionals view in context of change in profession, service, cost etc.

1. INTRODUCTION

Our society is a changing society. Each stage of cultural development from clay tablet to paper, from papers to printed book has lasted for centuries. Libraries are also changing to keep up with the changing societies. To cope up with changes libraries of present day offer a very different service from service they offered ten years back and next ten years are likely to *see* even great changes. In this changing dilemma the challenges facing us is not establishing question, whether librarians can change or not -

history shows that we can - but whether we can change fast enough to keep pace the expectation of our client, and whether we can maintain the high quality of services to users who come to library, and have expect from us. The challenge is not to predict the end point of the change namely, what the Internet enable future will be - but rather to better understand what we must do today and tomorrow, no matter what the Internet becomes or brings about... What people and institutions can do to cope with the changes the Internet will bring, however, it emerges.

The challenges to us are therefore, one of the understanding and applying technology in such ways, which serve our mission. Lancaster's Paper-lees society is myth in present day. Many people seem to believe that paper and printing of 20th century will be obsolete in 21st century with the emergence of computer technology. But it is quite obvious that both will be co-exist in peace with electronic information in this century and it will continue to prosper until such time, when a PC costs as much as a book is as easy to carry around as a book and it is as comfortable to read screen for hours as reading a book and all printed information is available in electronic form. The fact is that libraries have been changing from more or less a warehouse at the beginning of the century to an information center at the present. This changing can be visualized in term of Human, Service and Organization itself. This changing will continue, but in all centuries libraries must exist to perform functions like: (a) Selection and collection of information; (b) classification and organization of information; (c) dissemination of stored information; (d) preservation of information. The only change will be the tools used to perform these functions.

2. HUMAN ASPECT AND CHANGE

The key to success of digital library is the availability of library and technical staff with suitable skill and experiences. A traditional attitude is certainly important in placing the priority upon service and upon the needs of users, but there has to be willingness and an ability to changes procedures and method to suit new resources. Traditional skills of accuracy and analysis will become very important in ensuring that library users obtain in information, they need but non-technical skill will require realizing the potential of the new medium. New young professional who have grown in the electronic ear will have a good future but experienced library professionals will also be vital to ensure the most cost-effective and efficient services.

Another most important issue to success of digital environment lies in staff training. The element in using the new electronic services to the full lies in people rather than technology. In order to install the networks, we must recruit the right efficient people rather than people having some relation with authorities. In order to purchase best electronic information, we need advice from people who understand information. In order to use electronic resources to improve services to user, we need well-trained, well-motivated people on the staff of libraries. When we are further to have such people on our staff their training and career development must be amongst our highest priorities. Young as well as older generation professional can both helpful in this new environment who are trained, skilled and understand electronic information. The mission of libraries may be expressed in different way through services, but the solutions to problems encountered in traditional libraries may provide pointers to solution to problems encountered in the new electronic environment.

Librarians must have to keep up with the change of technology too so they can continue to help those who need it. They have to understand computer to use it in library. Libraries and librarians alike are working to keep with their resources and knowledge of today's speeding technology.

3. SERVICES ASPECT AND CHANGE

There are so many 'information jump' in these days - from speech to writing to printing and now to wire and wireless communications. Now this gigantic open system - the Internet - has offered tremendous opportunities to library professionals, but it also has many inherent problems, such as traffic congestion, the lack of bandwidth, quality of services, etc. The universal information access allows technically, anyone, anywhere, could talk, write, confer with, or send multimedia, textual, audio, visual - digital information to anyone else in any of the world. Kelly (1996) pointed that "if larger portion of collections budgets continue to go to pay for access, mechanisms should be in place to ensure that information is not only achieved but also readily available". In term of reference service, by using Internet in present day, accepting and answering query via email is very common. The development of WWW has created a daunting world of information. Using number of individual and met search engines, librarians of present day can solve maximum query with a fraction of minutes. So question of long range and short-range reference service is some extent vogue.

People, most of the time wants fast access of information. The traditional interlibrary loan, which means moving, printed information or photocopy form one library to another was labour and time intensive and also expansive. Today's mode of access in digital environment is as fast as we can.

With the development of communication and networking technology in tremendous fashion, library automation has evolved into the age of virtual library. In the circumstances of virtual library, all the data are arranged and presented through hyper linking. Information exchange is accelerated. The one-way mode of academic exchange has been converted into a multi-way mode or other unknown modes. Computer, so to speak, has replaced part of the library function, which renders doubtful the role of library in the process of academic exchange and knowledge creation. The change of the library organization, the integration of reader service with technology, the combination and the division of library functions, alteration and regulation of personnel is common in many well-established libraries. In this age, librarians should promote his role and turn himself or herself as the information manager and information keeper whose main task is to arrange and provide information in the past into the information filter and creator. Only in this way can feel no qualms upon contributions to history and future and create the bright future of librarians in the coming century.

4. ORGANIZATIONAL ASPECT AND CHANGE

Organizational accommodations are one of the major part in digital library. How can the library organization best adapt to digitization projects? The customary functions of catalogue, acquisition, collection development, and reference certainly have analogous operations in the virtual world, and perhaps lend themselves to digitization and electronic publication tasks.

Many libraries however, are creating new position and departments to develop and manage electronic resources. Libraries lacking the resources to form new departments may rely on work teams of existing staff. There has been a widespread belief that the introduction of new technologies will inevitably lead to radical changes in the organizational structures of libraries. It is interesting that there has been so much speculation about the impact of technology with so little demonstrable change. The

organization charts of today's libraries did not reflect radical changes in the way libraries are organized; the introduction of technology has not affected the basic, bureaucratic structure. Instead, the structure of many libraries has changed in a way that is not reflected on the organizational chart. Rather than, completely restructuring, libraries and information centers are becoming more hybrid in structure with some departments organized more organically than others, or they employing overlays or modifications imposed on the basic bureaucratic organizational structure. The physical remains largely intact, but modifications are in place.

Libraries like other type of organizations are moving away from the strictly hierarchical organization to another form of organization. They are moving at different speeds and they are adopting different types of organizational structures, but they are in the process of changing and becoming post-hierarchical. Regardless of the structure chosen, it must be one that will facilitate flexibility and change. The age of rigid unchanging organizational structure is over, and organizations must be ready to meet changing conditions and needs. At the same time, there must be a core of stability built into the structure since no organization or its employees can functions effectively if the organization is being completely restructured at frequent intervals. The most successful organizations find a way to build stability into the structure but at the same time to incorporate organizational features that permit innovation and responsiveness to the external environment.

There is a critical throughout the entire process from the very start, for effective communication. This communication needs to be both external, for the academic library is part of a larger organization that needs to be informed about the proposed changes, and internal. If employees are not kept well informed about proposed changes, rumors will be rampant. Changes in organizational structure can be very threatening; good communication keeps well informed and helps to alleviate employee anxiety. Almost all the description of organizational changes in libraries and other settings stress the time and effort involved in the process, with most commenting that it look longer than they had anticipated to implement.

5. SOME CRITICAL APPRAISAL

5.1 In Context of Profession

Billings (1992) idea of a new order less or a new knowledge/thought/technology paradigm may be one such example. "Most importantly, however, as long as library professionals never lose sight of their mission and purpose to serve library patrons in the best possible manner, there will always be a place for librarians and libraries virtual or not".

Zink (1991) extols, "there will be no place (if there is now) for librarians who are not willing to interact with technology... To many librarians do not realize that period of later 1990's is one of unprecedented change, not only in library professional but in society as whole".

5.2 In Context of Services

Engle (1991) noted "recent dramatic advances in computer networking and the accelerated growth of information retrieval technology have brought about the beginnings of an evolutionary leap in resource sharing that is profoundly impacting the library landscape".

Woodward (1995) mentioned, "the internet is slow and circuitous" while in some cases. " Internet may provide the best, fastest and most cost effective way to attain the needed information, users can get buried or lost in endless means and dead-end link and end-up with useless or in accruable information" (Strong, 1996).

Williams F. Birdsall (1994) pointed "the electronic library is not a technological issue alone. The danger is to ignore the political and cultural implications of the electronic library, which in long term have serious consequences of libraries, librarians and the users of libraries".

5.3 In Context of Available Forms

Most obvious problem for preserving electronic information is the obsolescence of physical storage format. The office world has gone through transition of digital storage devices from 8-inch floppy disks, to 5.25 -inch floppies, to 3-inch diskettes, to CD-ROMs, to DVDs. Digital artists, requiring larger file sizes, have also used variety of optical storage disks, DAT, Syquest, Zip,

CDRW, etc. But these storage devices become obsolete very quickly, and today it's very difficult to find a drive for one of these storage devices that will work with a contemporary computer. For digital works, technologists offer the 'solution; that we need merely copy a file onto a new physical storage medium as the old medium become obsolete".

Crawford (1998) observed, "the physical print collections on public and academic libraries will continue to grow and be central to the mission of those libraries. The book still effective serves a variety of need better than any alternative. Digital books are hard to read and awkward to navigate the lengthy text. The public as whole has no need for, or interest in digital book equivalently".

Ray Tennant (1999 author of "The purpose of digital capture: Artificial or intellectual content", sates, "it is very visceral deeply affecting feeling to hold a very old book in your hands gently turning the brown and fragile pages, experiencing the unique smell of aged papers and having a physical link to history".

5.4 In context of Cost

Various professionals describe the cost of Digital/virtual/ computerized library. Crawford (1998) mentioned "Yet, people tend to print out anything longer than 500 words or so, it's just too hard to read from a computer, and it does not seem likely to get a lot easier. If every long text is printed out each time it is use, there are enormous economic and ecological disadvantages". "Cost associated with use of the Internet could also become an issue for libraries. At present, the cost for access, equipment purchase and maintenance, and other support activities are usually borne by the library's parent institutions. If access to the Internet or the next generation of global networks is controlled by commercial enterprises, libraries may no longer be able to look to their parent institutions to provide a connection to the electronic information highway at no cost. Whether the costs of access will be a flat free, metered, or some other arrangement is also unknown, and the method .of charging could greatly influence the type of access libraries are able to provide to their patrons as well as their staff" (Kelly, 1996).

Whereas, many librarians feel helpless, at the mercy of the technological forces which seem to be driving the process of change. There are companies, which are making huge profits from the sale of information. A vital element in a librarian's mission is to

represent the interests of our users. There is a risk that the cost of information will 'deny many people access to information. It is fair that we should be asked to pay for the value assed by publishers of information, but librarians have and important role to play in ensuring that the public good is not sacrificed on the altar of profit. We have co-operated on an international basis to resist the exploitation of information. Libraries have always worked for the public good and the challenges to ensure that electronic information is accessible worldwide at an affordable price provided an opportunity for us to express that old mission in a new way.

The cost associated with digital library cooperation is also new. It involves the key concept of aggregated- buying power. This is simply an economic concept borrowed from commerce. Manufacturer charges one price to wholesalers, wholesalers as a surcharge and sell it to the retailer and retailer charge us the consumer yet another price. Each level of aggregation reduce or increase the per unit cost. A consumer buys one unit; a retailer buys more, a wholesales buys even more.

The proliferation of electronic journals is staggering. The reasons are the immediacy with which scientific literature is disseminated makes electronic delivery the perfect format. Searching abilities with keyword, author, publisher, years, etc are now possible that were impossible in print only formats. Author benefit from reduction in publication time which, in turn, may introduce their work to wider audiences.

6. CONCLUSION

Despite of potential difficulties, barriers, and challenges, one thing is sure that the technologies and the infrastructure are in place now for us to experiment a universal global library. With this, the role of academic librarians for the new century will unquestionably change substantially. For the first time ever, lack of proper technology is no longer an obstacle. But, technology is not the end in itself rather than the means to an end. We should not suffer from the loss *of* direction caused by preoccupation with ever-changing technology. As the academic librarians speculate on their work in the new millennium, what we must do is to make sure we can develop a vision for our library's future in the Internet-enabled society, and define its role in facing a new frontier. But, the greater challenge for us is to understand the evolutionary path and the. Transmission strategies that will be necessary to guide us from where we are, today and any new generation Internet-

related vision of tomorrow. The reality is that, the movement has been, for some time, to do more for less money, and libraries need to maintain collections, manage new technologies, and recruit new staff one eye towards tradition and one eye towards these new technologies.

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MANPOWER PLANNING AND DEVELOPMENT FOR THE PUBLIC LIBRARIES IN THE CHANGING ENVIRONMENT: A STUDY OF KARNATAKA PUBLIC LIBRARY SYSTEM

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ABSTRACT

This paper covers in detail and also throws light on manpower planning, development and training which aims to ensure efficient use of people as manpower, which is considered as the most vital link of the library. But the present scenario especially in the public libraries is far from satisfactory as the trained and fully qualified staff is not found. The personnel working in public libraries should be given an opportunity or to make a provision for continuing education at all levels to improve their qualifications, knowledge, skills and techniques instead of getting stuck up in the service. Further it is also identified the role of ILA and RRRLF in development of manpower. In this paper an attempt also has been made to highlight the importance of manpower in the development of organization including library and information centers particularly in public libraries. Further this paper throws light on the Karnataka Public Library System, its structure and development, staff pattern, few important suggestions are also given to amend on priority basis the Karnataka Public Library Act, 1965, in general and C&R in particular.

1. INTRODUCTION

Human resources are the most valuable resources of an organization as the productivity of all other resources depends upon people. Human resource management (HRM) is the management of people at work. It is a comprehensive people oriented, action oriented, individual and group oriented, and future oriented. Human resource management involves both management and operative functions. Operating functions include procurement, development, compensation, integration and maintenance of personnel. The scope of human resource management is wide and it covers personnel and its welfare and organizational relations. Human resource planning is the most powerful tool for any organizations' success and the training of employees is regarded as one of the most important functions of effective resources management. In order to obtain a competitive edge in providing the best services to the customer, training which will develop a well-trained workforce is vital to render efficient and effective services in the modern Library and Information Centres.

Public Library which provides access to information to all sections of the community, without any distinction or discrimination. It is also a place for continuing education and life long learning. Besides the traditional role, the public libraries should make use of the benefits of Information Technology and Electronic Information to keep the citizens abreast of the latest developments in their respective professions" (Kumbar and Murthy, 2004).

The present society in which we are living is already labeled as 'Information Society'. We have already entered with lot of aspirations and hopes in all spheres of life. Modern way of life and technology has opened several corridors for our multifaceted development. Thus Public library system has to play a special role laying emphasis on democratic decentralization and effective people's participation in the process of socio-economic development of a nation.

In recent decades the facets of HRD are studied in depth while keeping in mind the following of an organization including Library and Information Centres.

(i) Survival and Stability
(ii) Growth and Development
(iii) Change and Diversification
(iv) Providing highest quality in products and services

(v) Playing a leadership role in the field;
(vi) Obtain goodwill and reputation through customer user satisfaction.

2. MANPOWER PLANNING

Personnel management is concerned with the most productive utilization of manpower resources. It is also described as 'Manpower Management'. Manpower Management is basically concerned with the principle of choosing the right type of people as and when required. It also takes into account the improvements in existing personnel.

3. NEED FOR MANPOWER PLANNING

Manpower planning and development, which aims to ensure efficient use of people as manpower, is the most vital link of the library. To enhance the professional avenues of fresh library graduates and to disseminate information in an appropriate manner, libraries require appointing staff, which possess IT skills so that they are in a position to perform a wide range of functions.

Fine (1982) believes that human factor is the most complicated aspect of any technological system, yet it is the one that gets the least attention. She therefore comments:

"The greatest marvel for technology is that if it has flaws, we can debug it; if it doesn't work at all, we can ignore it; and if it works well, we can make it work better. No one has as yet figured out a way debug the human factor. It is the most complicated aspect of any technological system. Yet it's the one that gets the least attention, is least discussed, the least researched, and perhaps the least understood."

Olsgaard (1989) also substantiates the importance of human factor in library automation with the support of the results of a study by Cirillo (1983) that over 85 percent of all failures in systems implementation can be attributed to 'people problems'. In the Indian context is also similar to that of the specialists in the developed countries. The technology is there, but without human support it cannot be utilized efficiently. While none of the individual changes caused by introducing a new technology are typically beyond the capabilities of a library staff, the enforced interrelationships between new technologies can cause an

impression of confusion. This can limit any positive outcome from the introduction of the new technology.

Planning is an analytical process, which involves.

- Determination of desired goals, objectives and set targets of achievements in a phased manner.
- An assessment of the future in relation to environmental changes, impact of IT etc.
- Selection of programmes, activities to accomplish set goals and targets.
- An estimation of resources required in terms of Finance, Equipment, Machinery, Manpower and others.
- Preparations of a written plan document and action plan execution.

3.1 Elements of Human Resource Planning (HRP)

- Estimating manpower requirements both quantitatively and qualitatively.
- Recruitment and Selection of Personnel.
- Induction and Deployment.
- Personnel Development.
- Overall assessment of performance of the Personnel.

3.2 Factors in Planning

The steps in personnel planning would constitute the following:

(i) Estimating personnel needs for the present and future.
(ii) Establishing result oriented recruitment and selection procedure for new staff.
(iii) Inducting new staff to the organization, that would be conducive to retain the best personnel for a longer period.
(iv) Progressive policies of personnel development treat the staff with respect and concern for their future.
(v) Ensuring quality products and services, keeping customer user satisfaction as the primary objective.
(vi) Evaluating products and services periodically to improve efficiency and effectiveness.

Moving towards this Information Society can be done in stages and Education and Training either taken concurrently or in the

stated order of priority should target the general public as well as those who will maintain this National Information Infrastructure.

Manpower Resource Development should address these criteria for development towards an Information Society (Eva, 1997).

(i) Social Criteria
The value of information should be recognized as an enhancing contributing factor to the quality of life. Widespread information consciousness and skills in information seeking should be promoted from the community schools level to the postgraduate level. Skills development from a certain level up has to include the use of information and communications technology.

(ii) Economic Criteria
Information should be seen as a key economic factor as resource, service, commodity, and a source of added value and employment

(iii) Cultural Criteria
The cultural values of information through the promotion of information values as in indigenous and local knowledge should be encouraged in the interest of individual and national development.

(iv) Political Criteria
Freedom of information and access to information will increase participation and consensus and sustain democracy.

(v) Technological Criteria
It should be seen as one of the enabling forces. The widespread diffusion of IT in offices, homes and education requires skills and training.

4. CHANGING ROLE OF MANPOWER WORKING IN PUBLIC LIBRARY

The development in Information and Communication Technology (ICT) has been changing the scene of LIS education in the country; as ICT has changed the sources of information, delivery of information and access to information developments challenge the Public Library Professionals. As a result, continual stress is being placed on restructuring of staff pattern, installation of IT gadgets and mechanism in Public Libraries. Under such circumstances, the Public Library Professionals need to constantly update with

their knowledge and skills in the changing environment (Kumbar and Ramesha, 2003).

5. KARNATAKA PUBLIC LIBRARY SYSTEM

The wise council prevailed on the minds of the Educationists, Administrators, and Planners of Karnataka to think and plan for the enactment of Public Libraries Act in the State. The Department of Public Libraries came into existence from 1st November 1966 consequent upon the implementation of Mysore Public Library Act, 1965. The Act provided for the establishment of the different types of libraries:

A State Central Library at Bangalore;
Five City Central Libraries; and
A District Central Library for each of the 19 Revenue Districts in the State.

"During the 4th plan period (1964-70) (Annual Report, 1971), it is proposed to establish 19 District Central Libraries, 5 City Central Libraries, 408 Branch Libraries and 5,240 Delivery Stations. But at present there is a State Central Library at the Apex of the State Library system. City Central Library, Bangalore has opened 13 branches and 16 Service Stations. City central Library Hubli - Dharwad has opened 6 Branches. Similarly, City Central Library, Mangalore, has also started functioning during the year. Twelve District Central Libraries are functioning with 32 branches and 35 delivery stations".

Thus, 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 awareness of culture, heritage, etc. of the land in particular and of the world in general.

At present, Karnataka Public Library System (Annual Report, 2003) is one of the most appreciated and viable systems, as compared to those in the other 27 states in India. The latest situation of the Public Library System in Karnataka is as under:

A. State Central Library (1)
B. City Central Libraries (15)
C. District Central Libraries (27)
D. Branch Libraries (354)
E. Mandal Libraries (3500)
F. Grant In-Aid Libraries (84)
G. Book Depository Centres (under RRRLF scheme) (2655)

6. STAFF PATTERN OF KARNATAKA PUBLIC LIBRARY SYSTEM

The below mentioned staff pattern of KPLS is clearly indicates that, it is most inadequate as compare to the number of libraries and their branches have been established by the Department of Public Library. Looking into the qualification fixed and the scales, these two have become major obstacles in obtaining the fully qualified and competitive personnel towards the Public Library System in Karnataka. But the present society is changing so fast and needs of the users are fully diversified to satisfy such needs of the users. The Public Library System in Karnataka is very much in need of fully qualified, competitive and highly trained manpower. To prepare and to provide such type of manpower it is not only the responsibility of the state Government but also many National Associations and Organizations has to take lead and work in this direction. Table-1 presents the staff pattern of Karnataka Public Library System.

Table-1 Staff pattern of Karnataka Public Library System

S. No.	Designation	Qualification	Pay scale (In Basic)
1.	Director	B.A. B.Lib.Sc. with 10 years Experience	9,570
2.	Administrative Assistant	Promotion by Seniority	5,575
3.	Special Officer For Mandal Libraries	B.A. B.Lib.Sc.	6,000
4.	Chief Librarian	B.A. B.Lib.Sc. with 5 years Experience	6,000
5.	Librarian	B.A. B.Lib.Sc. with 1 year Experience	5,200
6.	Assistant Librarian	Diploma in Library Science	4,200
7.	Library Assistant	S.S.L.C. with Certificate Course in Library Science	3,500

7. ROLE OF DIFFERENT ORGANIZATIONS IN PROMOTING PUBLIC LIBRARY MANPOWER DEVELOPMENT

Training is primarily a local activity, for which the incentive arises from the needs and opportunities of the individual's job and the Employer's role in Personnel Development. It is also to be

expected within a profession that guidance and encouragement should come from the National and State level Associations/Organizations.

7.1 Indian Library Association (ILA)

The Indian Library Association (ILA) being a National Association concerned with the professionals working in Academic and Public Libraries. It should have a clear policy on its second objective of training and to take further steps to implement gradually. The Association also takes up some of the important activities to train and develop the personality of the professionals working in Public Libraries. They are as follows:

A. Creation of sub-committee on Training and Education;
B. The sub-committee has to produce series of guidelines in Training;
C. To organize Training Programmes for the Library Professionals working in Public Libraries in different regions.
D. To organize at least once in a year a separate Seminar/Conference for the LIS Professionals working in Public Libraries; and
E. LIS Associations can reserve some space in their newsletters to cover the recent developments in Public Libraries in India as well as in abroad.

7.2 Raja Ram Mohun Roy Library Foundation (RRRLF)

RRRLF is the only national foundation to support the public library programmes in India. The establishment of the Raja Ram Mohun Roy Library Foundation (RRRLF) in 1972 as an autonomous body of the Ministry of HRD, Government of India, is an epoch making event in the history of library movement after independence. The main objective of the RRRLF is to promote and support the public library movement in the country by providing adequate library services by developing reading habits all over the country. The Government of India recognizes RRRLF should undertake some of the important activities in collaboration with national level LIS associations. They are as follows:

(i) The RRRLF have a primary responsibility to provide staff development programmes for public library employees. In these lines, the RRRLF should be taken into consideration

of following points strengthening the public library and its professionals too.

(ii) To take serious step to give the instruction to the State Governments for Recruitment of Professional Staff to provide the effective and efficient services to the people.

(iii) To develop a Continuing Education and Training model for in-service personnel to up-liftment of professional status.

(iv) To develop personnel skills rapidly in changing Information and Communication Technology (ICT).

(v) To improve the qualifications necessary for the next level position for the professionals working in Public Libraries.

(vi) To encourage professionals to publish their ideas and findings in the professional journals.

(vii) To join and to take an active part in professional organizations both at regional and national level.

8. SUGGESTIONS

(i) The National and Regional Professional Associations should constitute a subcommittee to organize Training Programmes and also to publish a series of guidelines on Training and Development of the Professionals working in Public Libraries.

(ii) The Organization like RRRLF has to identify few Departments of Library and Information Science and provide financial assistance to those Departments to organize periodically the Training Programmes to update the knowledge and skills of personnel working in KPLS.

(iii) The authorities of the Public Library should encourage the professionals to attend different Training Programmes/Workshops organized by National/ Regional professional bodies at least once in a year to get exposed to new ideas, skills and techniques.

(iv) It is the ripe time for the Government of Karnataka to amend the K.P.L. Act, 1965 and Cadre and Recruitment rules to give scope for talented, highly qualified and competitive personnel to serve in the KPLS.

(v) Keeping in view the role and responsibility of the senior positions like Chief Librarian, Librarian and the Assistant Librarian, the internal promotions and selections are stopped and the recruitments be made exclusively by the Karnataka Public Service Commission.

9. CONCLUSION

The new information revolution is rightly emphasizing the professionals to redefine the concept and role of Library and Librarians. Information Storage and Retrieval devices of recent times have made a tremendous impact on selecting organization and dissemination of vast amount of information. In these days of financial crunch, technology enabled networks and other infrastructure facilities enhanced the accessing the information through networks there by saving the time, money and space. The time is ripe to convert the Public Libraries as Community Information Resource Centres rather than a mere collection of books. Introducing rapid computerization Library activities can do this. Networking has to be established amongst all the types of libraries at all levels. At present computerization of Public Libraries is progressing slowly and steadily. Be it has to go a long way. The commitment and involvement of the highly skilled and experienced manpower is the need of the hour to give a face-lift to the K.P.L.S.

However it is a matter of appreciation that, the Public Libraries in Karnataka have started planning for the Library Automation Programmes. In this direction State Central Library and the 5 City Central Libraries located in Bangalore have all most completed the task of computerization. Efforts are also being made to avail the NICNET connection to provide the Database Access. Attempts are also made to set up the GISTNIC and DISNIC booths at selected libraries in Bangalore and some District Head Quarters.

The knowledge is ever changing in every discipline and Library and Information Science is not an exception. To understand the changing concepts in different areas of Library and Information Science the LIS professionals need to participate in Seminars, Conferences, Lectures, Extension Programmes, Short-Term Training Programmes, Workshops etc. to mould their vision and outlook.

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MANPOWER PLANNING FOR DIGITAL ENVIRONMENT: A CASE STUDY OF MANIPUR UNIVERSITY LIBRARY

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ABSTRACT

Higher education depends critically on acquiring the knowledge of using a modern library to the best advantage. Recent developments in technology have made a great impact upon modern library, revolutionizing its functions and services .The main reason behind the adoption of technology is information explosion and availability of information in machine-readable form. The thirst for knowledge is increasing day by day hence the aim of library in order to provide up-to-the-minute information to serve the multi-function agenda of the university. In time to come automation is very much needed in university libraries in order to provide accurate and efficient services, to control the rapid growth of information, to enable new services and to accommodate increase workload. The paper highlights the information technology scenario of M.U. library. It also tries to bring forward the impact of information technology on the libraries as well as library professionals, problems in the application of information technologies, measurement of satisfaction regarding its application and attitudes of the library professionals and also the requirement of IT application for successful utilization of the resources emerging in electronic media .It

also suggests for overall improvement of the financial allocation specially for library automation.

1. INTRODUCTION

Manpower planning is synonymous to human resource planning. It is a process, which involves systematic mobilization and channelisation of manpower to meet the future challenges. The importance of library and information science manpower has risen considerably, due to IT development the physical form of documents have changed to non-book form, CD etc. supporting new services by means of new technology. In order to meet the changes mentioned above the personnel needs to acquire new knowledge of library and information science and skills of information technology. Man power planning in universities is most important but the neglected area of study in library management. Because information technology is a non-profit oriented organization. Thus manpower is a strategy to assume broader role of providing effective information to user's to develop scientific outlook in the jobs; to acquire new skills in order to produce and develop new programmes for handling information technology. Man power planning as the process by which management determines how organization should move from its current manpower position to its desired manpower position. Through planning, management strives to have the right number and right kind of people at the right place, at the right time, doing things which results in both the organization and the individual receiving long run benefit. At present there is any library, which is not manned by, professional and supported by semi- professional and non- professional personnel.

The term Digital environment conveys more or less the same meaning with information technology, Library automation and Digital library. The term Digital environment is use to denote activities connected with computer based processing, storage and dissemination of information. Information technology covers the application of computers, communication technologies, reprography, microforms including CD-ROM, online, networking database technologies in the tasks of information handling and information flow from the generation to the utilization levels. The impact of technologies on library and information science has been so pervasive and momentous that information technology is characterized as a second industrial revolution. Information technology is the fastest growing industry in the world and is poised to become the global industry. Information technology is

rated as a magical technology, which combines the skillful hand with the reasoning mind.

1.1 Manipur University (M U) Library

The MU Library was started along with the establishment of Manipur University in 1980 under the Manipur University Act. The MU Library at present is a spring of knowledge, which flow out to irrigate the wide fields of users namely Research scholars, Teachers, PG. students and non-teaching staff of more than 2264 members. The application of IT in MU Library was started since 1989.

1.3 Objectives of the Study

The objectives of this study are to find out the present status of Digital environment in Manipur University Library.

(i) to determine the status of IT infrastructure with regard to hardware and software (including library software) in MU Library.
(ii) to reveal the attitude of the library staff
(iii) to evaluate the need of manpower training for implementation of IT application.
(iv) to assess and evaluate the opportunities available to library personnel for their career growth and development.
(v) to highlight the problems of IT application.

1.3 Methodology

The study was conducted through questionnaire-based survey. A structured questionnaire with multiple choices and open-ended questions designed according to the objectives, was distributed to the Manipur University library staff with a request to fill it. Altogether there was 35 staff in MU library excluding office bearer, helper and peon. A total of 30 questionnaires were distributed, out of which 27 were collected. The data thus collected was processed and analyzed and the results obtained were discussed in the light of known facts to arrive at the findings and conclusion is presented in the following sections.

2. OBSERVATION AND ANALYSIS OF DATA

Analysis of the data is presented in the following tables:

Table - 1 Strength of the staff

Category	Male	Female	No Response	Total
Professionals	4	2	-	6 (22%)
Semi-professionals	6	4	1	11 (40%)
Non-professionals	6	3	1	10 (37%)
Total	16	9	2	27

A total of 27 questionnaires were collected. As per the data, Manipur University Library is suffering from lack of sufficient professional staff .he authority needs to see this aspect and appoint more library professionals, which amounted for only 22%. Semi-professionals accounted the most with 40%.

Table - 2 Persons technically qualified for computerized operations in the library

Category	Numbers	Total
Information Scientist	1	1
Computer operator	2	2(7%)
Little knowledge	24	24(64%)
Total	27	27

The above table shows that MU Library is not equipped with trained staff for automation. The meager staff available for computer operations is also due to lack of interest in the part of the higher authority to send staff for training programme conducted by INFLIBNET periodically. The staff development programme has to be increased to strengthen the staff technically to suit the changing environment.

Table - 3 Satisfactions of manpower issues

Elements	Very satisfied	Satisfied	Not satisfied	Total
Salary	-	-	-	-
Working condition	-	10(37%)	17(62%)	27
Job offered to you	-	20(74%)	7(25%)	27
Opportunities to take part in seminars/ workshops/symposium	-	2(7%)	25(92%)	27
Opportunities to enhance qualification	-	-	27(100%)	27

The above table reflects that the staffs were not satisfied with the working condition with 62% saying not satisfied, and 92% responded to the category of not satisfied to the opportunities to take part in seminars/workshop/symposium. While 100% replied not satisfied to the opportunities to enhance qualifications. Over and above the attitudes remained not so satisfactory in all the elements given. The library committee needs a serious introspection in all the matter mentioned above.

Table - 4 Attitudes towards IT

Attitudes	Favorable	Unfavorable	Total
IT makes work easier	20(74%)	7	27
IT generates more interest	22(81%)	5	27
IT enhances my work	20(74%)	7	27
Fear to influx of IT professionals	-	-	
Search and evaluation is easy	23(85%)	4	27
Eliminates tedious & repetitive work	21(77%)	6	27
IT has made work more stimulating	20(74%)	7	27

Here the staffs are requested to indicate their awareness of the emerging IT environment. The response is given in the table - 4. Most of the staffs were aware of the IT and were in favors of

application of IT in the library. Those who said unfavorable were mostly the non- professional staffs.

Table - 5 Hardware facilities

Description	Nos.	RAM	Speed
PC-386	3	2MB	33MHz
PC-486	1	8MB	33MHz
P-I	1	16MB	120MHz
P-II	1	64MB	333MHz
P-IV	7	128MB	1.6GHz
P-III	5	256MB	1.5GHz

- Printer - 2
- UPS-18
- LAN facility-1
- Network facility-10
- CD-ROM Drives-10

The above table shows the overall infrastructure of the MU. Library in regard to the Hardware's of IT application. At present the infrastructure provided is quite sufficient in comparison to the staff available that can operate the infrastructures. But if the library needs to be more effective in the future than it needs to purchase more to provide to the areas which are without the facilities of computer at present.

Table - 6 Software facilities

Software	Users no.	Remarks
Windows NT	5 users	installed
MS-SQL server	5 users	installed
SCO(UNIX)	NA	Not installed
Windows 95	NA	installed
Windows 98	NA	installed
Windows XP	NA	installed
CDS/ISIS	NA	installed
SOUL	NA	installed

Software helps to bring hardware establishment into activation and real use. The software facility available in the MU Library is presented in Table - 6. Here it was found out that CDS/ISIS was the first library package acquired in early nineties with a nominal price of Rs. 1500/-. SOUL is the upgraded software introduced by INFLIBNET, which is being used at present mainly at the library. The M U Library started automation by creating bibliographic databases. This software was based on DOS and UNIX. However, lack of trained manpower was the major problem before the library for the proper use of the available software. Even though the software was installed there was very few staff that could apply it in their works.

3. PROBLEMS OF INFORMATION TECHNOLOGY APPLICATION

Below are listed some of the problems related to the application of IT in M U Library are as follows:

- Irregular power supply.
- Non-availability of latest database server and nodes with high storage capacity.
- Lack of qualified manpower to operate library automation in library.
- Lack of IT training to the staff for data creation and in-house database.
- Availability of less numbers of library professionals.
- High cost of IT infrastructure.
- Limited numbers of library professionals.
- Lack of long-term approach to automation. As such there is no allotted budget for the development of automation of the MU Library.
- Lastly, the uncooperative attitudes of the staff amongst themselves.

4. IMPLIED SUGGESTIONS

The views and comment offered by the staffs of the MU. Library has enabled the investigators to offer some feasible suggestions.

(i) The present study have seriously considered necessary for the library authorities to take up proper training facilities of the staffs for the application of IT, otherwise it will lead to the decline in the quality of the library services. Hence it urges the state govt. to lift the

ban in regard to the appointment of the staffing the earliest.

(ii) Government agencies/central government needs to provide augmented budgetary grants for strengthening training facility in the use of IT.

(iii) Library professionals should join hands themselves and come forward to improve library services with the help of emerging ICT application.

(iv) At the time of selection of the staff for any post there should not be any discrepancies but should be appointed according to the norms provided by the UGC.

(v) The application of IT at present is very limited in the areas like circulation, cataloguing, classification and creation of database only. For an effective library it needs to apply to all the sections of the library as soon as possible.

5. CONCLUSION

Human resource is the most primary and most crucial factors in determining quality level of a library. For the effective functioning of the academic libraries, proper human resource planning is highly necessary. While conducting the survey, it was strongly felt that our academic libraries have to adopt the tools of IT in order to provide information to the user community. Use of computer for resource sharing and networking has to be accelerated to face the challenges posed by the developments in IT taking place in India and abroad. The present study also reflects a sad panorama of M U Library pertaining to their Human resource planning in regard to the IT environment. The survey results highlights that non-professionals outnumbered the professionals. And most of them were computer illiterate. The response of elements provided also reflects a sad view. As a result the library is unable to provide effective services to the users and fail to cope up with the fast changes of library environment due the emergence of IT in library.

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NEED FOR PROFESSIONAL UPGRADATION IN THE FIELD OF LIBRARY AND MUSEOLOGY

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ABSTRACT

The paper initially highlights changing role of library management in handling additional activities of Museum section in special research libraries It further stresses need of requirement of manpower in managing a Educational Museums. The paper further discusses the special skills required for the purpose and expresses need of framing educational programes at various level including in local languages and also of orientation programs useful in retraining of library trained personals used presently in functioning of Educational Museums. The paper gives further results of pilot study undertaken by the researcher in support of his observations Research problems. Then it takes a stock of various existing educational programmes in country. Including universities in Maharashtra and pin points their inadequacies. The paper in concludes lists the themes or skills, which researcher would consider in preparing draft educational and orientation programmes in the light of need of special manpower required to manage the educational Museums.

1. INTRODUCTION

If we observe functioning of any type of library it is seen that in recent times, various new forms of library and information services have been emerged. Explosion of information has further influenced them. Modern concept of information marketing is now being used for promoting information products. Libraries are also considered to be a medium of sharing of thoughts and ideas. In this sense library is in a process of providing mutual benefits to the receiver i.e. reader. Thus library is treated as a heart of an educational institute. Nowadays, it has become an essential need that the personalized, pinpointed and authentic information

services to be provided to the readers. In these changing scenario libraries requires adopting strategic change in library management, which would influence in their functioning.

2. CHANGING ROLE OF THE LIBRARY MANAGEMENT

Today academic and research library are not confined only to a collection of books and journals. Changing role of the library management demands handling of nontraditional material like non-book / multi-media material and some times articles concerned with study and research relating to history & culture. In the libraries especially of artifacts it creates an additional demand of have additional section called "educational museum" in addition to normal section.

Normally libraries have a number of sections and activities like Reference service sections Reprographic section, Circulation section, Books Purchase section, and Technical Processing and Periodical section. However, some libraries do have educational museums and they try to preserve and maintain objects and antiquities as per the goals of the parent institution. While handling these antiquities library worker required to know sufficiently about the subject and the concerned objects and the library management try to organize the skills so that such type of museums would be meaningful for researchers.

General museums provide information to all sorts of public. The objectives of such type of museums are helpful for the community services including entertainment. However, the role of educational museums is to serve mainly researchers and also in addition society in vicinity.

3. EDUCATIONAL MUSEUMS

The 'Museums Association of India' is contemplating the researchers service. The association considered museums and Adult Education departments, at par for the use of mass media, study on arts and cultural life of the community and also support for formal university, colleges and school level education.

No doubt that the educational museums play an important role in formal education but today we see the situation of educational museums is very poor. Main reason for this could be due to availability of inadequate expertise with workers managing them. If the management of such type of museums were done with scientific method then such museums would play more useful role in this field. Like 'organization of any library in museum various

functions are expected to perform like acquisition of museums objects, their registration, documentation, storage, display or presentation, conservation study and provide information services with a view to their interpretation, publications guidance books, poster and pictures etc. In addition to these existence of postcards and catalogues or even dissertations in the holding of museums proves to be beneficial for the community of scholars. Ensuring the safety and security of the museums materials against damage and degeneration, vandalism, pilferage or burglary and accidents & offering guide services to the researcher is not a easy to perform.

4. NEED OF WELL-TRAINED STAFF

Presently some of the universities are taking keen interest in maintaining educational museums. The U.G.C. has stressed on the changing functions of museums as educational Institutions. 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 educational museums the role of staff is very important and they must carryout the work with responsibilities. But unfortunately today the staff that is working in such sections is not adequately qualified or has no skills to maintain educational museums. Such appointed staff needs to acquire additional necessary professional skills for effective management of educational museums. Unfortunately in India the status and qualification of a museum keeper / curator/ or technical staff is not appropriately defined for the purpose.

The numbers 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 facilitate this either short term or long term programmes are not available in Maharashtra. Moreover, the skilled manpower is essentially required for department like archaeology, epigraphy, numismatic and for forts.

5. SIGNIFICANCE OF THE PROBLEM AND NEED

We have learnt about the organizing of museums from the Britishers. The subject is quite important for the researchers while brining about the educational museum's development in India. Since we consider importance of museums as a store- house of the object pertaining to history and culture then we must think about scientific management of their objects and have skilled manpower to maintain the collection. If we need skilled manpower

then we must arrange required training through specific educational programs. Looking into their requirement the researcher has initiated a project of framing the educational programmes for museology for development of Manpower in Museology.

6. THE RESEARCHER HAS DECIDED TO HAVE FOLLOWING OBJECTIVES FOR HIS WORK

(i) To gather information about the professional skills required for managing educational and other museums.
(ii) To evaluate existing curriculum of library & information science and museology.
(iii) To develop draft for short and long term educational programmers in museology.

7. SCOPE FOR DEVELOPMENT OF MANPOWER IN MUSEOLOGY

(i) Development of short and long term educational programs is pertaining to the management of educational museums attached to the librarians in the colleges, universities and management of other museums in general.
(ii) Study is confined to educational and other museums situated in Mumbai region.
(iii) Evaluation of existing curricula of libraries and information science and musicology is also limited to programs undertaken in academics and other Institutions in Maharashtra.

The researcher has decided to have following objectives:-

The project is limited to the development of certificate level short term and degree level long-term educational programs in musicology.

8. PILOT STUDY AND ITS FINDINGS

For knowing present situation of managing educational museums and the need of skilled human resources to maintaining the educational museums in the libraries, pilot study was conducted opinions of the major libraries of Universities and P.G. colleges which is related to the Educational Museums were considered.

The pilot survey indicates that

(i) 67% Libraries have their separate educational museums and Educational museums have been organized in more than one room. These 67% educational museums have total carpet area in the range of 100 to 500 Sq. feet.

(ii) 67% Educational museums are located in the library.

(iii) Not a single educational museum has separate building.

(iv) According to opinion of respondents educational museums are used for history, antiquities, rare -books, political science etc.

(v) 100% respondents known that the educational museums could exist in the library and they have visited other educational museums and 67% respondents have read about the educational museums.

(vi) All the respondents have not received any circular or guideline from their superior authorities. It seems that there is a need of guidelines from authorities for functioning of Educational museums.

(vii) 33% respondents opined to establish the museums in institution or library, financial and managerial help is expected.

(viii) 33% respondents are expected to have special course having syllabi for educational museums and they know about the course pertaining to this area in University of Delhi.

(ix) 67% respondents have expressed need wanted to maintain the educational museums with skilled human resources for knowledge attachment and educational aid etc.

(x) Regarding training and development of manpower required for managing and maintaining educational museums. 33% respondents suggest professional association, which would arrange training programmes, and other 33% respondents suggested seminar Exhibition etc.

It is felt that such research will be benefited in drafting short and long-term programs in specialized areas of museology.

9. SURVEY OF EXISTING EDUCATIONAL PROGRAMMES IN MUSEOLOGY AND ARCHAEOLOGY AT NATIONAL LEVEL

During the British India Governor General Lord Repon decided to train curators through Department of Museology. Second all Indian museum conference was resolved that the different branches of provincial museums should be under the supervision of expert management and that no exhibition of specimen can have much educational value unless it is arranged and supervised by a man who has made a special study of this field.

Indian School played a major role in the field of archeology. In the Year 1959 actually training was started with the first batch of students.

In India Many committees were set up to look in to the working of the museums and training of curators, e.g.. Wheelar Review Committee, 1965, Dr. Randwa Committee and Dr. Motichandra committee.

The Department of Museology of the University of Calcutta is one the Pioneer such University Museology department in India founded in the year 1959.

Only one University e.g. M.S. University Vadodara (Gujrat) a full – fledged museology department by then (1942 has been offering museum studies courses for more then 50 years its alumni now include several hundred of its M.A. in museums studies) Other Universities and alike institutions followed suit e.g. Banaras Hindu University, Varanasi, Aligarh Muslim University, Osmania University, Hyderabad, Prachya Niketan, Bhopal, Birla Institute of Technology and Science. Pilani, etc. 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 since1990.

10. PROGRAMMES IN UNIVERSITIES IN MAHARASHTRA AND THEIR INADEQUACIES

Across the Maharashtra it noted that University of Mumbai is oldest and had a big museum section and larger number of antiquities collection. But such university has no degree or PG Courses related to museology Or Archeology. Prince of Wells museum (Now Chatrapati Shivaji Museum) located in Mumbai has great historical references but there are no concrete syllabi for training of manpower.

Just now one college i.e. K. C. College, Churchgate Mumbai started three year integrated degree course as "Bachelor in Heritage Management". The fees of this course are so costly and this course is does not highlight the museum functions in the library. It indicates that the existing educational programmes are inadequate and the status affects the functioning the museums.

In the second week of Oct.2004 one workshop was arranged by Directorate of Libraries Maharashtra State & Raja Ram Mohan Roy Library Foundation at Darabar Hall, Central Library Mumbai.

This workshop resolved that

(i) Need of Absorb new braches in the field of library science as requirement of time
(ii) Revision in the syllabi of the courses in the library sciences must be undertaken.
(iii) 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 develop 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 & Certificate or 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 qualifications.

11. LIST OF SKILLS TO BE CONSIDERED FOR FRAMING THE NEW PROGRAMMES

There are grounds for serious concern about the quality and professional relevance at least the drafting of the syllabus of the courses and programmes 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) Special classification methods and schemes
(iv) Organising the collection in the museum
(v) Display and exhibition techniques
(vi) Short term and long term Reference services (manually and electronically
(vii) Arranging tape-slide and light and sound programmes for community services
(viii) Special preservation techniques
(ix) Copyright
(x) Digitization and digital preservations
(xi) Inter museum loan and exchange services and networking
(xii) Participate in national and state level culture and heritage preservation policy programmes.
(xiii) Creating database of museum collection and providing referral services
(xiv) Publish bibliographies and directories of collections and experts in the field of museulogy

12. CONCLUSION

In research libraries especially which are attached with PG Courses in historical and cultural studies role of educational museum section is very significant. Managing educational museums requires special skills. Presently such work is carried out with the help of people who have some knowledge of library functioning. If the work is done with scientifically it would be more meaningful in research point of view. There are some courses at national level but of PG level which are not adequate to meet the man power requirement in the field of museology. In order to generate & develop skilled human resource and also train the existing people some specific short-term diploma, degree and certificate level educational programmes need to be arranged for better functioning of museums attached to educational institutes and libraries.

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PROFESSIONAL UPGRADATION FOR DIGITAL ENVIRONMENT THROUGH HUMAN RESOURCE PLANNING IN ACADEMIC LIBRARIES OF ORISSA: A STUDY

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ABSTRACT

Academic libraries have undergone a rapid and dynamic change through past few decades. On one side there is an increasing demand for processing of data and retrieval of information in the quickest possible time, on the other hand the print and non-print medias are undergoing revolutionary changes. Further the new developments of Information Technology have made the traditional library and its services gliding towards computerized library and more recently digital library. In this changing context, it is highly necessary to upgrade library professionals to face the new challenges and provide satisfactory services to their users. The paper is based on a survey result of academic libraries of Orissa, which reveal a sad panaroma. The paper thoroughly discusses about academic library system and services in a digital environment and need for professional up gradation .It highlights the present situation of the state through data analysis. Also suggests how professional up gradation can be made through human resource planning.

1. INTRODUCTION

Among different types of libraries i.e. academic, public and special libraries academic libraries are more complex in nature than other types of libraries due to its collection, diversified target users and their demands for pinpointed information in quickest possible time. In any educational system, particularly in the competitive world of today, qualitative education in every subject is highly essential, where academic library play a vital role in teaching, learning, extension and research programs. Therefore for comprehensive

development of educational system and also nation, the academic library is the prime moves and ipso facto the highest importance.

Among trinity of academic libraries, human resources assumes the most important place than collection and finance, because without its proper planning and management other two factors can not be used properly. Human resources of an academic library consist of both professional and non-professional supporting staff. The success of a library mainly depends upon the skill and competencies of professional staff, hence require proper attention in the human resource planning process for professional development.

1.1 Purpose of the study

Human resource planning in academic library is an analytical process which involves an assessment of the future manpower requirements in relation to environmental changes, professional trends, technological advances and their influence on all aspects of library development .It is a process by which it can be determined how organization should moves from its current manpower position to its desired manpower position through proper estimation, recruitment, placement, training and performance appraisal of library professionals.

Based on the fifth law of library science i.e. "Library is a growing organism", academic libraries have undergone rapid and dynamic changes through past few decades. On one side there is an increasing demand for processing of data and quick retrieval of information, on the other side print and non-print medias are undergoing revolutionary changes. Further the new development of Information Technologies has made the traditional library and its services gliding towards computerized library and more recently digital library. The basic features of digital library are that they are networked based distributed systems with individual servers responsible for maintaining local collections of digital documents.

Human resource planning in academic libraries is most important but neglected area of study in library management, which directly affects the performance of library professionals, which in turn hampers library organization and its services. Thus the present study is an attempt to assess, evaluate and analyze the scope of professional up gradation in the existing human resource planning process of Orissa and suggest possible remedial measures for its development.

1.2 Scope of the study

The scope of the study exclusively limited to academic libraries of Orissa, which include University libraries, P.G.College Libraries and degree college libraries only. The present study excludes junior colleges (+2) and school libraries of Orissa. Further, among the university libraries, the study includes only the library of Sambalpur University, Utkal University and Berhempur University. The study is also restricted to professional manpower of academic libraries, the provision for their improvement in changing libraries environment through proper human resource planning.

Thus the scope and limitation of the proposed study can be summerised as follows:

i) The study is confined to only academic library of Orissa state.

ii) The study includes the library of the then Sambalpur, Utkal and Barhampur University and the library of their affiliated P.G and Degree colleges till the year 1994. (Now these libraries are distributed among sambalpur, Utkal, Barhmpur, North Orissa, Fakir Mohan University and Biju Patnaik University of Technology.)

iii) The study is restricted to professional manpower of academic libraries and the provisions for their improvement/up gradation only.

1.3 Methodology of the study

According to the purpose of study, the research method was designed. Based on the literature review, variables that might influence the study were identified and research instruments were developed to meet the requirements. Also as per the need of the study, it was imperative to adopt survey method as survey research enables to obtain empirical knowledge of contemporary nature. In survey, the data collection techniques used is normally questionnaire, observation and interview. For this study, questionnaire technique was adopted and the data collection instrument was a structured questionnaire, which were mailed to different academic libraries. Also the investigator visited many libraries to fill up the questionnaire personally.

In order to make the resulting analysis statistically sound and meaningful, statistical methods like percentage, mean, x2 (chi-squire) test were applied.

2. DATA ANALYSIS AND INTERPRETATION

As per the scope of the study, questionnaire were mailed to libraries belonging to affiliated institutions of t6hen Utkal, Sambalpur, Berhampur University affiliated upto1994, which are 545 number in total .Out of 545, in spite of repeated reminders, only 366 libraries responded with there filled in questionnaire with a response rule of 67%. However with this moderate rate of response, it was decided to carryout the work of analysis and interpretation of data.

The findings of data analysis can be summarized as follows.

(i) Out of 545 academic libraries under the scope of study, the academic libraries established between 1970 and 79 have a greater rate of response (90.9%), where as these established between 1990-94 have a poor rule of response (42.8%). Besides the libraries established up to 1959,1960-69,1980-84 have moderates rate of response of 84.6%, 90%, and 68.7%, respectively .It indicates that the libraries established after 1980 are not properly managed and organized.

(ii) Out of 366 libraries responded, the number of government academic libraries is only 68 in numbers (18.58%)where as aided and private libraries are 298 in numbers (81.42%) .It indicates that the most of the academic libraries are financed and managed privately.

(iii) Out of 366 libraries, 75 libraries (20,49%) are headed by unqualified staff, where as maximum libraries are headed by persons with B.Lib. & Inf.Sc. qualification only (44,53%). It indicates that qualified library professionals do not head all libraries.

(iv) Further, the rate of computer literary among heads and the library are very poor. The data analysis shows that out of 366, only 70 are computer literate (19.12%) and only 32 have a formal degree in computer science. (8.74 %).

(v) The recruitment methods are almost all libraries are neither open, nor exhaustive. The analysis shows that

out of 366 libraries, maximum libraries (340) only followed interview method for recruitment (92.9%) 18 libraries follow written and interview method (2.18%) where as in no library professionals are recruited through SSC or P.S.C.

(vi) Almost all the libraries do not follow any staffing pattern. It can be seen from the analysis that out of 366, in only 3 academic libraries, staffing pattern is followed (0.82%) where as in 363 libraries it is not followed (99.18%).

(vii) In all 366 responded libraries lending service are provided. Further only in 42 libraries (11.46%) some type of reference services and in 24 libraries (6.56%) reprographic service is provided but in a limited number of libraries is 10 (2.73 %) information is accessed and disseminated by using IT tools.

(viii) Only 30 libraries (8.2%) out of 366 have their own computers in their libraries where as 336 libraries (91.8%) do not possess a computer Further out this 30 libraries who possess computers, only 10 libraries (32.3%) uses a standard library software package to computerize their library. This analysis indicates a miserable state of affairs for academic libraries.

(ix) The scope of continuing education, in service training programmes in academic libraries is limited. The analysis shows that out of 366 libraries, only 184 libraries (50.27%) have provision to allow to study LIS or any other related IT course and only 3 libraries (0.8%) have provision to attend in service training programmes.

(x) A majority of respondents i.e. 303 (82.79%) out of 366, suggested that due to lack of automation, the present library services are not adequate to meet their users demand where as 27 (7.38%) respondents suggested in opposition to this and 36 respondents (9.83%) did not suggest on this. Further the respondents suggested different factors which effects the library automation programmes are given in Table - 1.

Table-1: Factors which effects Library Automation in libraries

Sl. No.	Reasons	Great Extent	Small Extent	Not at all	X^2
i)	Equipments	F –215 % -(58.74)	-139 (37.98)	-12 (3.28)	*172.44
ii)	Finance	F –208 %-(56.83)	-137 (37.43)	-21 (5.74)	*146.08
iii)	Motivation	F-140 %-(38.25)	-147 (40.16)	79 (21.79)	*22.93
iv)	Support from Authority	F- 89 %-(24.32)	-87 (23.77)	-190 (51.91)	*56.89
v)	Training	F-175 %-(47.81)	-169 (46.18)	-22 (6.01)	*123.09

* Significant at $P < 0.001$.

The analysis of Table 1 (i to v) reveals that maximum respondents were of the opinion that the main factor which effects library automation programme is equipment to a great extent, followed by finance, training to library professionals, support from authority and motivation for which academic libraries are not able to automate their libraries. This is also supported by chi-square test.

The scope of continuing education, in service training programmes in academic libraries is limited, The analysis shows that out of 366 libraries only 184 libraries (50.27%) have provision to allow to study LIS or any other IT course and only 3 (0.8%) have provision to attend in-service training programme.

The data analysis reveals that out of which 366 respondents300 (81.96%) were in the opinion that they are able to provide information service to their users by using latest IT tools if proper facilities and training programmes are made available to them where as 66 (18.03 %) were in the opinion that IT personals are required to do that job.

3. FINDINGS

The findings of data analysis can be briefly summarized as follows:

i) The academic libraries established after 1980 are more in numbers are mostly non-government libraries and are poorly staffed, unorganized, improperly managed and weekly finance.

ii) All libraries are not headed qualified library professionals and also all are not computer literate.

iii) Since requirement policy is not exhaustive, it affects the quality of library and also encourages the recruitment of unqualified person in library in library professional job.

iv) The academic libraries do not follow any staffing pattern, therefore the no. of professional staff and their service conditions are inconsistent in all libraries.

v) In all libraries computers are not available and also none of the libraries are fully computerized. Thus the libraries have failed to implement library automation programme and thus are not able to shift towards digital environment.

vi) There are little provisions of in service training; continuing education programmes for up gradation of libraries professionals' competencies to meet the new challenges passed IT development.

vii) The reasons for lack of library automation programmes are lack equipments, poor finance, motivation, training facilities and support from authority.

vi) The analysis shows that none of the libraries even the University libraries have provision for library professional's performance appraisal.

vii) Human resources planning is largely neglected by authorities which hampers the improvement of professional's skill and competencies.

4. SUGGESTIONS

Library professionals are an important input in an academic library services. As such well qualified and trained library professionals in required number are essential to run and administer the academic library in the progressive development of IT, particularly in a digital environment. But the survey result indicates a gloomy picture of the fact because defects lie in human resource planning process. Therefore to overcome these problems, some important suggestions are as follows:

(i) U.G.C. or any such agencies should decide what minimum services an academic library should provide

in this changing library environment. Accordingly a fixed staff pattern should be followed in all libraries.

(ii) Since finance is the main hindrance towards library automation and digitization of information, INFLIBNET or any such agencies should provide financial assistance and if not, at least the minimum hardware, software and other IT tools to each academic library. In this context it is also suggested that the present facilities offered by these organizations to University libraries only should be extended also.

(iii) Selection and recruitment of library professionals should be made through PSC or SSC and the skill, qualifications required should be consistent with the nature of jobs to be performed.

(iv) In order to upgrade professional competencies, a continuous programme of education, training and other in service/off service courses should be implemented

(v) The professionals should be provided with required motivators such as monetary gain, working conditions, authority in decision-making, personal growth and development, self-esteem etc. to upgrade their skill in a changed digital environment.

(vi) Lack of performance standards hinders the professional's performance; hence performance appraisals should be regular phenomena.

(vii) Since academic libraries are financed and controlled by parent organization, authority should provide adequate support for professional up gradation.

(viii) The professionals should also try to develop their skill and competencies in changing library situation.

5. CONCLUSION

The present study reveals a sad panorama of academic libraries pertaining to human resource planning and the scope professional up gradation in the existing planning process as per the rapid changing situation from its traditional environment to a digital

environment. Even if the introduction and use of IT in academic libraries is in the initial stage, it is true that the age of IT has opened and their foundations have been laid down. It is also fact that there will be no place for traditional libraries in the domain of information and may have nominal existence reduced to status of a storehouse of documents. Thus in this changing situation, professional up gradation is must to carry out democratic access to information rather than custodian of documents. Failing which libraries will be replaced by internet cafe, knowledge kiosks etc. and the bread and butter of library professionals will be snatched away by other IT professionals. Therefore it is concluded that immediate steps should be taken to remove the impediments in human resource planning, particularly in up gradation of library professionals in the changed digital library environment.

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ROLE OF LIBRARY PROFESSIONAL IN DIGITAL ENVIRONMENT

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ABSTRACT

The paper discusses the status of library professional in digital environment. The objective is to present an unbiased account of the present scenario which has been largely affected by advances in Information and Communication Technology. It also discusses the importance and role of library professional in digital environment, highlighting the suggestions for professional adaptation in digital era.

1. INTRODUCTION

The Concept of library is not new; through many differences exist between the libraries of ancient India and modern India. As an observation the basic idea does not show any big difference. In the ancient period owing to the absence of printing, only hand written books or manuscripts comprised the library. In modern society situation has been changed. The basic function of a library is education. The significance of a library in modern society lies in educating the community in the wider sense of the term. The library also plays a sociological role in different culture stages and as a social institution. The growth and development of libraries, an area under study, has witnessed an enormous exuberance, to which so many diverse factors have contributed. It is the need of the hour that the government of India should give serious consideration to the problems being faced by the libraries. Only then the wish of the Late Prime Minister Pt. Jawaharlal Lal Nehru,

which he expressed while inaugurating the Gujarat Vidyapeeth library on January 5, 1955, can be fulfilled. He said that *it should be our endeavor to locate at least one library in every village in the country*. The Indian libraries, infect, draws from the evolution of society and a consequent rise of the library as an important institution of human civilization and culture, the course of which was modulated by political, social, economical and cultural development. In the Info–tech-age, information is considered as the key resource for the economic, socio-cultural and political development of the nation. Importance of a library professional in digital age is very crucial.

2. DIGITAL LIBRARY

In the information age digital library is a hot cake for every one. Digital libraries are a set of electronic resources and associated technical capabilities for creating, searching and using information. In this sense they are an extension and enhancement of information storage and retrieval systems that manipulate digital data in any medium and exist in distributed networks. The digital library is not a single entity. The digital library requires technology to link the resources of many, many libraries and information services. The digital library offers users the prospect of access to electronic resources at their convenience temporally and spatially. As we are all aware of that digital library are the libraries of future. There are number of organizations provides total solution for digitization of library resources therefore our main thrust is on the selection of library Resources for the digitization keeping in view of the targeted users. It is the need of the hour that librarian/Information provider should keep abreast to the broad issues and rapid development in the digital information field.

The transition to an information age is an evolutionary one. Demand for more and more immediate information is the major impetus hasting the evolution. The user can not wait they are in hurry. In this age of Information, libraries will never sleep and information will always be on the shelf, available when needed. We know that libraries in some sectors are being used more than ever. We also know that users are going directly to electronic sources. Customer can reach to their desired results with in three clicks so that they can access the digital libraries more and more in their field of activity. Digitization actually fulfils the need for preservation and conservation. Trough digital library we can share

the information internally, within the organization or over World Wide Web.

3. ROLE OF LIBRARY PROFESSIONAL IN DIGITAL ERA

The Library professional will have a challenging and dynamic role to play in the electronic information environment. The technology is progressively replacing the old methods of information collection, storage and retrieval. In the 21st century most of the documents will begin to publish in electronic full text form and will be available online. Advances in multimedia applications will add new dimension to a librarian's job. Library professionals have to face the challenge of this changing scene.

Librarians in the digital world become the storekeepers of information. This role will increasingly move towards offering consultancy to the users in their effort in navigating through the web of documents that span the global library. He needs to become a link between the digitized database and the information seekers.

Can technology take information straight to the user? Does the librarian keep himself up to the mark in changing environment? Technology alone cannot help bring about the required changes but attitudes, practices and policies need to be changed if the librarians in India are to benefit themselves and their community of users by the application of new technologies. Librarians must be involved in creating independent thinkers. The digital information age has enhanced librarian's roles to knowledge navigators and instructors teaching the discipline called information literacy.

Digital information environment is fast becoming a part of our day-to-day professional activities. The way we carry out research, teaching and learning is not going to be the same at all. Computers can help to generate catalogues in an expected standard format. However this alone is not sufficient. Only such librarians who navigate the Internet also will survive. To participate in education, training and development programmes that lead to better utilization of information resources by the beneficiaries of our service at large, is quite imminent. Librarian as an information manager is a crucial individual in management system of an organization that is responsible for his own library management. In this age of information technology, electro use age the basic requirements of a librarian are to be shelled in functional

especially such as information technology, legal and human resource.

The role of the librarians will change significantly as they become increasingly viewed as managers of both information and knowledge. As they have been guides for the use of traditional library materials, librarians will become guides to network tools. Librarians do more than connect people to raw information: they use their expertise to help clients to make sense of information. Librarians usually arrange search results and other information products into customized sets for their clients. Librarians can be seen as distributed cooperative agents. Librarians inform and negotiate with each other; cooperation is built into the fabric of library work. Librarians have always played a key role in education. In most cases a librarian role was limited and in some cases more passives than proactive in the area of instruction. A librarian's role has traditionally been more of the builder of library collections and maintainer of library collections. Today, in the digital age, librarians can no longer be simply information or the 'keepers of knowledge'. The changes in technology using electronically stored and retrieved information has changed the way patrons and students are able to access, retrieve and use information. The instantaneous access of information through the Internet has made vast amounts of information and data available to anyone with a computer, a modem and a provider. Digital information is changing the role of librarians from a person to whom students ask for assistance in finding information in a place. The process of evaluating books and purchasing books is still vital to building a quality library collection.

3.1 New Trends

Knowledge- to have understanding – is the element that may be missing when simply accessing stored digital information. Using that information effectively in the educational process is the key. The Challenge that librarian face as knowledge navigators is to link information to the process of acquiring knowledge from that information. "Information is knowledge" is not completely true. Only when critical thinking skills are used in conjunction all the instant information that is available on the Internet. There are several ways that can begin to meet these challenges brought on by electronic information and the explosion of the World Wide Web as a vehicle to make information available to the World. Many libraries are using a variety of tools and techniques to assist students in finding and evaluating information. The following

is a list of some ways that the librarians are working towards the needs of users:

(i) Provide organized access to information
(ii) Provide Instruction through learning guides and on-line tutorials
(iii) Provide access to guides to recommended search engines for the Internet
(iv) Provide instruction in the area of information technology

3.2 Digitization in India

In India now these days, digitization is a hot cake. The awareness about digitization is felt in the entire professional Institute in India. Institutions are also conducting number of conferences and seminars on it. The development process on this is very slowly. We can say that digitization is in childhood in India. We are unable to enter into digital library system into a big way. The problems that are faced while entering into the digital world can be listed as follows:

(i) Lack of adequate local and national infrastructure for handling IT and networks
(ii) Lack of well-trained manpower
(iii) Lack of digital library policy
(iv) Lack some legal point
(v) Possible control of censorship of information by local body's government or other bodies
(vi) Lack of freedom to access International electronic documents
(vii) Lack of funds

In India, initial steps towards building a true digital library have been initiated at some places like IIT, IIM, JRD Tata Memorial Library, Hindustan Lever Research Centre, National Institute of Mental Health, Indira Gandhi National Centre for Arts, Central Secretariat Library and Delnet etc.

3.3 Challenges in Digital Era

The Library of Congress has identified some challenges that must be met if large and effective digital libraries are to be created during the 21st century. In some cases there may be no technology solution to the challenge but through sharing of ideas, new thinking may emerge to help institutions such as the Library of Congress formulate policy on these

important issues. The Library hopes that creative and innovative minds can devise solution to these challenges:

(i) Develop improved technology for digitizing analog materials
(ii) Design search and retrieval tools that compensate for abbreviated or incomplete cataloguing or descriptive information
(iii) Design tools that facilitate the enhancement of cataloguing or descriptive information by incorporating the contributions of users
(iv) Establish protocols and standards to facilitate the assembly of distributed digital libraries.
(v) Integrate access to both digital and physical materials
(vi) Develop approaches that can present heterogeneous resources in a coherent way
(vii) Make the National Digital Library useful to different communities of users and for different purpose
(viii) Provide more efficient and more flexible cost for transforming digital content to suit the needs of end-users
(ix) Develop economic models for the support of the national Digital library
(x) In the last but not least some legal concerns associated with access, copying and dissemination of physical and digital materials

4. MEASURES FOR PROFESSIONAL ENHANCEMENT

It is time that we understood the fact that information technology is going to stay forever. Library professionals need to change their attitude now. The present scenario of librarianship involves several factors like demand for information at finger tips, information revolution, and changes in information revolution, internet and intranet, web publishing, electronic publishing, floods of publications, increase in cost of publications, budget constraints and competition. Apart from these, following factors may be beneficial for professional upliftment:

4.1 Quality

If the quality of information is not up to the mark, it would adversely affect the organizational performance as it affects decision- making. Especially in the digital era, the quality of information professional should be good. The philosophy of quality is based on understanding user's needs and

improving user service and satisfaction. At the information revolution age the user wants high and qualified staffs that provide him better information. In implementing quality in library and information service environment, it is necessary to establish some basic definitions by answering. It is necessary to establish some basic definitions by answering question, such as "what is quality"? "Who are users? "How can quality be measured"?

4.2 Performance

The term performance appraisal is now increasingly being replaced by performance development, performance planning, development review, work planning and review, performance analysis, etc. With competition becoming tougher, there is pressure on the library professional to perform better. Library services may be improve through high performance of library professional.

4.3 Qualification

At this stage a lot of library in India does not have qualified trained and experienced staff. So it is also special attention needs to be paid to the professional's education. That would be definitely fruitful for the upliftment of library professional. Without highly qualified library professional a library cannot survive. In this competitive age, if the library professional should be more qualified then he/she definitely promoted. The status of library professional would not improve if they were not qualified.

4.4 Training

Training is an instrument of developing the employees or workforce by enriching the skills and improving the human behaviour, which result in organization development, adequate enough for the accomplishment of objectives from time to time. It helps organizations and individuals to develop themselves in consonance with the changing needs of the environment in which they survive, operate and progress. Introduction of new technology and using it for productivity necessitates, the staff is required to learn new skills and undergo training. The increasing need for well-trained people using sophisticated tools to perform more complex tasks has made well thought out skills training more necessary than ever. While organizing training programmes, the library

management should bear in mind the fact that the training will have long-term impact on the staff. Human resource development is a continuous process, which matches organizational needs for human resources and the individual needs for a career development it enables the individuals to gain their best human potential by attaining a total all round development. Human resource development promotes dignity of employment of every employee of an on organization, and provides opportunities for teamwork, personal development and career development. In the age of digitization following training are essential:

4.4.1 Basic Computer Training

The computer has tremendous capacity to store and process information with a great speed. In the age information revolution the library professionals must be attend the basic computer training. Today when libraries are making use of modern communication media like e-mail, electronic Journals, e-book, fax, telex, satellite communication, telecommunication, on-line network, etc. the primary level of knowledge of computer is must. A lot of information is available on the net, if the library professionals are internet savvy then he can provide the electronic information to user. Users are not interested into book they want latest information through net, in that case library professional can provide more information.

4.4.2 Library Automation Training

Library automation is basically required to save duplication of effort in various library jobs. The database of in-house collection is the primary tool on which most of the library services are based. As an institution primarily concerned with tracking, controlling and servicing of information sources, most of the vital operations require effective database tools to take care of the routine tasks. This can be achieved in the manual system with the help of catalogue cards, book cards, and registers or verification forms. With the help of database and allied programs, the house keeping tasks can be performed faster with extra benefits like better inventory mechanisms. Library automation training program defiantly improves the status of library professional.

4.4.3 Library Software Training

We cannot imagine now these days a library runs without library software. Numbers of software packages are now available for automation of library activities and providing various services. These are available either for an individual function or for an integrated set of functions. These packages should be carefully evaluated before acquiring them for a library. We are living in info-tech age. So advanced libraries must have library software. Libraries have three options before them for software adoption. They are in-house development of the software; developing a package through customizable software; and purchasing of commercially available software. As the universally accepted truth for every sphere, this is valid for library system also. The success of libraries depends more on the strength of their services and their ability to connect electronically. The entire library professional must attend library software training program. The library professional should be proficient in different operating systems, database management & library software.

4.4.4 Communication Skills training

Communication in the library is the lifeblood of library services. No library services can develop in the absence of effective internal and external communication. Communication is the process by which information is transmitted between individuals and /or organizations so that an understanding response results. We can say that communication is an exchange of facts, idea, opinions, or emotions by two or more persons. In the information revolution age library professionals must attend communication skills training programs, because only the library professional can give the right information to users. What resources library does have only library professional knows. The communication situation is said to exist when:

(i) there is a person desirous of passing on some information;
(ii) there is another person to whom the information is to be passed on;
(iii) the receiver partly or wholly understands the message passed on to him;
(iv) the receiver responds to the message

If the library professional communication is too good then user can much availed the library resource. Institution like INFLIBNET carrying out training programmes on different aspects of librarianship periodically. The information professional could either make use of the same or undergo training when library management conducts such activities. The contributions of INFLIBNET in this particular aspect are a unique effort as far as the developments of information professionals are concerned.

The responsibilities of library professionals to acquire organize and disseminate right information to the users. The maintenance of librarian-user relationship will be the major challenge before library and information professionals. Present time digitization of library is very initial stage. It will take time, but near future there is a big scope of digitization of library. As the users demands and query institutions /libraries must think about the digitization of the resources.

5. CONCLUSION

Well-educated, trained and experienced library professionals are strongly needed. Information officer needs to maintain the parameters of information though the parameters pose a number of problems in the systems in an organization. The impact of information is common in our day-to-day works if the quality of information is not up to the mark, then it would adversely affect the organizational performance as it affects decision-making. Especially in the digital era, the quality of Information Professional should be good. At this stage a lot of library in India does not have qualified, trained and experienced staff. Therefore, special attention needs to be paid to the professionals' education and training program, in regular basis, that would be definitely enhance and upgrade their skills in the maintenance and functioning of the libraries.

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STATE OF HUMAN RESOURCE DEVELOPMENT FOR DIGITAL ENVIRONMENT IN AGRICULTURE LIBRARIES

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ABSTRACT

The paper examines the present state of digitization, IT infrastructure and professionally rained manpower in agriculture libraries. The paper suggests the professional up gradation, formal and continuing education programme and concludes with measures for improving manpower for digital environment.

1. INTRODUCTION

The Agriculture Libraries and Information Centers have served the Nation since the inception of Agriculture Universities and Institutes. There are 29 State Agriculture Universities, one Central University, 9 Deemed Universities and 50 ICAR Central Research Institutes, 28 National Research Centres in India providing education and research facilities for development of agriculture in India. Each of these institutes has libraries catering to their needs. The development of libraries in these organisations has been along with the growth and development of these organisations.

The libraries and library management is undergoing significant changes today not only in outlook but also in function, services, methods and techniques for collection development, processing and dissemination of information. Agriculture libraries in tune with

other libraries have to keep in pace with technological development emerging in management of library resources. They have to have an eye not only on catering the requirement of present generation providing up to date library services but also contemplate upon steps/strategies for shaping the libraries for the hitch generation of the future. Various factors like emergence of digital collection/electronic sources of information, library automation and networking, reorganizing of official position etc. have posed challenges before the agriculture library professional to keep pace with the complexities of present requirement.

The agriculture libraries have been far behind in adopting the new technologies due to reasons of less funds, lack of trained human resource, motivation etc. There is need for the library professionals to look at Agriculture Library Resource Development in wider perspective to cope with the changing role of library services and the need to adopt various tools and techniques of Information and Communication Technology make library and information services user friendly and relevant to the parent organisation.

1.1 Scope the study

The scope of the paper is to evaluate and examine the present state of digitization, IT Infrastructure and professionally trained manpower in agriculture libraries. The need for professional up gradation, formal and continuing education programme and to suggest measures for improving manpower for digital environment. The idea is to provoke further discussion and reflections rather than to sharply draw any conclusion.

2. DISCUSSION

The analysis and discussion is based on the information collected from various LIS publications and latest reports on status of agriculture libraries and their developments in India. The discussion is based on the following relevant parameters

2.1 Status of Technology Infrastructure in Agriculture Libraries

The present state of digital environment in agriculture universities and ICAR institutes is not very encouraging; most of the State and ICAR Institute libraries are still in the preliminary stage of digitization. A few libraries provide access to CD ROM search on

campus Intranet but not outside campus locations through Internet (Rao, 2004). Although several efforts have been made by ICAR to improve the condition of agriculture libraries and information centers in order to meet the latest challenges of technological development by appointing several committees under eminent scientist and educationalist viz. the Randhawan Committee (1960) Indo American Agriculture Library Survey and study team (1965) headed by Dr Dorthy Parker Ramiah Committee (1969) and Edith Hesse Committee (1997). The studies made by these committee created deep awareness among the library professional and administrators in meeting the challenges of providing better library services. Although most of the recommendations made by these committees have been since accepted by ICAR however, few were implemented. Realizing the need of digital environment in Agriculture sector the Indian Council of Agriculture Research (ICAR) in early 1991 initiated a project called Agriculture Research Information System (ARIS) within Indian National Agriculture Research system for strengthening information and management culture and creating digital environment by linking all ICAR institutes and state agriculture universities. For implementation of this project World Bank provided funds for purchase of computers and necessary infrastructure for digitization. In order to modernize the libraries and information center a total budget of Rs. 130 crore under NATP has been ear marked of which Rs. 94 crore has been allocated for ARIS and Rs. 36 crore for development of library component in information system development by providing computerized electronic databases of Indian research finding in agriculture sciences (ARIS, 1999).

As the libraries and information centers play an important role in all academic and research activities it was felt absolutely essential to upgrade and modernize agriculture libraries. Agriculture Research Library and Information System (ARLIS) one of the modules of ARIS for library improvement and networking and has been developed under Information Development Scheme (ISD). ARIS envisages that the library services should be improved by means of network using computers and satellite communication technology so that the resources can be shared. The project has provided enough support to State Agriculture Universities (SAU) and ICAR institutes for developing a network and a digital library accessible throughout the campus and also WAN if it is a multi campus institution. ARIS cell and ATIC (Agriculture Technology Information center) have been set up in several ICAR Institutions and SAU's, several institutions have fiber optics based campus LAN and have Internet access through ERNET / NICNET.

Libraries are being digitized and beginning to subscribe to the electronic journals they are linked to Intranet and Internet but limited bandwidth available in most institutions has been major constraints leading to many frustrations in the use of Internet Technologies. Further a policy on establishing uniform standards and procedures for the institutions of NARS for ICT equipment software and connectivity is yet to evolve leading to much avoidable confusion and delay in adapting to the use of Internet Technologies (Rao, 2004).

2.2 Current State and Prospect of Human Resource in Agriculture Libraries and Information Center.

To achieve digital environment in agriculture libraries besides the development of good infrastructure, human resources too requires be developing and upgrading to meet the digital challenges. Training the professionals in fundamentals of IT, database creation websites designing networking etc is mandatory. According to a recent study on progress of automation in 19 State Agriculture libraries and 37 ICAR Research Institute it is noted that only 35.96% of working staff has computer literacy (5) which is much below 50%. Since the handling of information in the present era is greatly influenced by IT tools and latest technologies continuous training of library professionals in latest developments is important. Realizing the strong influence of IT in Information management the Indian Council of Agriculture Research with support received from World Bank under NATP project embarked upon training the manpower in libraries and information center as a prerequisite to implement its total library automation and networking program in Agriculture sector across India. National Agriculture Technology Project (NATP) authorities selected INFLIBNET Center as the national level training center for Agriculture librarians in India. Nine training programmes in a series under the title "ICAR-INFLIBNET Training Programme for Agriculture Librarians on Networking and E-Resources Management" of two weeks duration was held at INFLIBNET center from June to Nov 2003 in two phases. A total of 127 participants were trained from 87 different agriculture institutions (University News, 2004).

Although the efforts made by ICAR to train the manpower in agriculture libraries is an encouraging step there should be continuous training programs for updating their skills as per the Technological changes taking in Information and Communication Technology. The human resource development is continuous

process and needs to be upgraded by deputing the library professionals for various formal and informal training.

2.2.1 Formal Training

Library and Information science professionals like the teachers and research officers of agriculture universities and research institutes should be deputed for formal training programmes conducted in the country from time to time. In order to get the maximums benefit of the use of IT technologies in libraries the training should be planned and designed in a manner so as to include the fundamentals of computer and communication technology, planning for LAN, use of multi-user operating system, and appropriate library management software package, e mail, Internet, web designing and web hosting, CD server, etc. should be included in the training. The training should be designed according to professional cadres and preliminary knowledge; there could be separate programmes for senior and junior level professionals. Continuing education programmes like refresher courses conducted by UGC, and short-term trainings conducted by NISSAT, NISCAR, and various Library Associations etc. play an important part in sharpening the human resources in the latest technologies.

2.2.2 Informal Continuing Education Programme

Informational training's also plays an important role in updating the library professionals in latest developments. Agriculture libraries should make special provisions for allocation of grants etc. for deputing their staff to attend the conferences, workshops, seminar etc and should be encouraged to present papers, participate in deliberations for achievement of professional competitiveness.

Budget provisions should make for the library professionals to travel abroad to the developed countries to have first hand information on advanced agriculture information services and new technologies. ICAR in collaboration with some foreign mission should develop some scheme to help in funding these visits.

Agriculture Library Associations can play an important role in development of Agriculture Libraries and Information Centers. It provides a forum to the professionals to share their experiences on continuous basis. The association can play a vital role in conducting training's and short courses for library professionals in

IT and other Technological developments besides providing informal training through conducting seminar workshops

3. SUGGESTIONS

Creating good human resource for digital environment in libraries is not one time act but dynamic and continuous activity which requires sharpening as per the technological changes and developments. It is suggested that:

(i) Library professionals should be deputed for continuous education programmes and training's from time to time to upgrade their skills. Some provision should be made in the library budget for human resource development. Besides professional up gradation should be made mandatory for promotions to senior grades /scales.

(ii) Agriculture Library Associations can play an important role in providing continuous education programme by holding of conferences, seminars training programmes etc. There is a need to revive the functioning of Association of Agriculture Libraries and Documentlist (IAALD) in India which has now gone into long dormancy due to lack of professional commitment .At least one conference at national level followed by state level seminar conducted by state agriculture universities would encourage to discuss professional matters.

(iii) A national level Agriculture Documentation Center on the pattern of DESIDOC and INSDOC now NISCARE need to be established for promoting agriculture documentation, taking up project to help agriculture libraries in database development and retrospective conversion, bring out scholarly publication like Indian Agriculture Sciences Abstract, Directory of Agriculture Science Periodicals etc. Develop software package exclusively to meet the automation requirements of agriculture libraries, besides train the agriculture Human Resource for digital environment to meet the latest trends in Information Management.

(iv) Several high level committees have been appointed by ICAR in the past to meet the challenges of IT and bring improvement in the functioning of Agriculture Libraries

and Information Centers. Generally the studies made by these committees create deep awareness among the authorities and led to the acceptance of recommendations made; however, the implementation part always remains inadequate and lacking. In order to press the authorities to implement the recommendations made by these high level committees there is strong need for the revival of the Standing Library Advisory Committee of ICAR which consists of Librarians of Agriculture Universities and ICAR Institutes with DDG (education) as the chair person. It is noted that the Standing LAC of ICAR remained dormant for last 20 years. However, it was revived in 1995 after couple of meeting and paralyzed again (Lal, 1998). There is a need for strong professional commitment by agriculture librarians to revive the standing advisory committee and meet at least once a year to review and discuss the problems, needs of HRD and reengineering agriculture library services.

4. CONCLUSION

Libraries and information management is going significant changes in their functions to which agriculture libraries are no exception. Training and up gradation of human resource has become vital for creating digital environment. Although ICAR is taking steps to train the manpower it is not a one time act but needs to be made a dynamic activity for which Agriculture Library Association, Standing Library Advisory Committee of ICAR needs to be revived for reengineering library services in Agriculture sector.

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COPYRIGHT: ITS IMPLICATIONS AND TRANSFORMATION IN DIGITAL ERA

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ABSTRACT

Digital information can be accessed quickly and smoothly around the globe, copied for preservation without error, stored compactly, searched very instantly. These quick and smooth searching are allowed under certain liabilities which are based on Intellectual Property Rights. IPR in digital environment should be protected from the infringement of the unauthorized users. The users as well as resources must be authentic by adopting some techniques and procedures. Techniques for authenticating users like, password, etc; and for resources like, Digital Signature, Digital watermarking etc. and requirements for permitting protection (under legal system) may differ from nation to nation. The copyrights means the right to copy or reproduce the work in which copyright subsists.

The growth of electronic commerce has propelled the need for vibrant and effective regulatory mechanisms to further strengthen the legal infrastructure, so crucial to the success of E-commerce. All these regulatory mechanisms and legal infrastructure come within the domain of cyber law. As the Internet grows, numerous legal issues keep popping up. These issues range from domain names to Intellectual property Rights to E-commerce, privacy, encryption, electronic contracts, cyber crime, online banking, spamming and so on. The paper emphasizes copyright and cyber law, implications in digital age, it's guaranteed of protection, validity, reliability and authenticity, network security and computer evidence, and discusses the protection of copyright and challenges of Internet.

1. INTRODUCTION

The copyright issue prevails in the world from century back and it is a part of Intellectual Property Rights (IPR). IPR are compound/ group with Patent, Trademark, Copyright, Geographical indications and Trade Secrets and they are protected their scope of protection and granting protection as per requirement (under law) may vary nation to nation on International basis (i.e. TRIPS, WIPO and EEC etc.) It is a personal asset and it may be bought and sold, licensed, leased, exchanged and may be taken up as the other property deals.

2. COPYRIGHT AND CYBER LAW

Regarding copyright the matter has taken up above in brief, the word cyber law is related and interlink to copyright law under the present circumstances or under the IT Act 2000. The development of e-commerce has propelled the need for vibrant and effective regulatory mechanisms to further strengthen the legal infrastructure so crucial to the success of e-commerce, e-mail or Internet searching.

Cyber law is a constantly evolving process and on global scale it is at an early stage of development just like different civilization and societies in history has taken time to develop and refine their legal systems in the case of internet too, it will take some time for cyber laws to be fully developed and refined. Different countries on the globe are adopting their own policies to this new effect.

Indian govt. has given a fillip to cyber law by passing the Information Technology Act, 2000. But some issues still needed their place under the Act, however it has wide ranging ramification for the growth of e-commerce and e learning in India. IT Act 2000 does mention the issue the problem of media convergence. The era of convergence is the era of monopoly ultimately leading to only a few major players may be 5-6 who will be competitors. In order to curb the creation of monopolies effective laws are the need. The payment system to the second party is still pending under the IT Act and therefore no legal status or validity of an electronic instruction for payment in India. Negotiable instruments are included from the applicability of the Act, so all transaction concerning with or relating to e-commerce, e-mail and e-library involving the Negotiable Instrument Act would go under the civil matters. This would mean delayed and protected legislations in

case of any e-commerce payment dispute, (particularly on e-journals or e-books).

3. IMPLICATIONS IN DIGITAL AGE

Today awareness about cyber law is beginning to grow. Earlier a number of technical experts feel that legal regulation of the networking is not required, but as the rapid growth of information technologies and the networking on the globe, it is clear that no activity on the net can remain free from the influence of the cyber law. When the billions of web pages are added every day on the net. Publishing a web page in an excellent way for any business to vastly increase its exposure to millions of persons, organization and institution and libraries worldwide. It is that feature of the Internet, which is causing much controversy in the legal community.

The main focus of the paper is on copyright under digital age, which has endeavor show as to how it may help flourish e-commerce, e-mail, e learning, e-library. What will be the payment mechanism, encryption, digital signature, computer evidence, network security and Internet regulation help in smooth functioning of e-commerce etc. Protection of IPR specially the software copyrights and Domain Name, how the jurisdiction issues and cyber crimes are posing a threat to the smooth functioning of cyberspace. Up to what extent the IT Act 2000 of India is competent to provide security to cyberspace and check on cyber crimes under digital age.

3.1 Payment Mechanism

The author endeavored, to examine the safety of payment, the mater of digital signature which is possible only when the most sophisticated techniques of encryption is developed at global level and which is the lifeblood of e-commerce and e-library. It has led to a parallel development of digital cash and what is termed "micro transactions", several payment schemes exist on the Internet, which allow customers to buy cash with a once only credit card deduction. The customer can then use the cash pay out very small sums online. This is alleged to be an efficient way of paying for subscription site, but the promoting companies lack the backing of major banks at this stage. Cyber cash, which recently merged with the pioneer, first virtual, is a leading contender in the field along with Digi Cash.

4. PROTECTION, VALIDITY, RELIABILITY AND AUTHENTICITY

4.1 Digital signature/water marking

Digital Signature means a signature affixed in electronic form consisting of a transformation of an electronic record using asymmetric cryptosystem and a hash function such as a person having the initial untransformed electronic record and the signer's public key can accurately determine whether the transformation was created using the private key that corresponds to the signer's public key and whether the initial electronic record has been altered since the transformation was made.

Since the signature uses the original text as an input to the encryption algorithm, the signature will not decrypt properly, if the message is a altered in even the slightest way. Thus, the person receiving the message can be sure that the message has been received without any alternation and that the signature is not copied from a different message. Digital signature generally contains 1024 bites. So it has a very long life.

Any person who wants to use digital signature should have an Internet explorer or Netscape communicator installed in his computer. These devices can handle the security certificates issued by a certifying authority. While sending the electronic message, the sender has to forward the security certificate as an attachment to the message. The sender's private key will convert the security certificate as a code. The browser will automatically send public key along with the message. The receiver can press the security button in the Netscape's tool bar read the decoded digital signature. If the receiver uses Internet explorer, has to click the tools Internet options and then click the content tab; he can view the security certificate.

4.2 Network Security and Computer Evidence

Security in e-commerce and m-commerce: since Internet is open, interested and global network security of data sent over the public networks is primary concern. Security in e-commerce: In general, the business and individuals interested in e-commerce face four primary issues in terms of security. Privacy, integrity, non-repudiations and authentication that the message is private, identical between identified parties and generated by known source respectively and this can be achieved by data encryption

techniques. With the rising frauds in the area of e-commerce, e-banking and other forms of cyber crime such as internet abuse, cyber terrorism that has become global threats, central bureau of investigation (CBI) is training its personal to develop expertise in navigation through the cyberspace and understand the cyber criminal and crimes.

It is unfortunate fact of life that people do not always tell the truth, sometimes people forget, sometimes they lie or circumstance change which leads one party to remember matter differently. Any modern system of commerce depends partly on trust but mainly on the fact that agreements between the parties are documented. In e-commerce this situation is crucial since the parties to the agreement may never haves physically met or spoken to each other by telephone. In most cases the only evidence of the agreement between the parties will be documentary evidence on transaction. But there may be particular problems because the document will be computer generated.

First will be calculation or analyses generated by the computer itself through the running of software and the receipt of information from other devices such as built in clocks and remote sensors. This type of evidence is termed real evidence.

Then there are documents and records produced by the computer, which are copies of information supplied to the computer by human beings. Cheques drawn and paying in slips credited to a bank account are hearsay evidence.

Finally there is derived evidence, which is information, which combines real evidence with the information supplied to the computer by human beings to form a composites record. This too is treated as hearsay evidence in modern evidence statutes. An example of derived evidence is the figure in the daily balance column of a bank statement since this derived from real evidence (Automatically generated bank charged) and hearsay evidence (individual cheque and paying in entries).

4.3 Computer Crime: E-commerce, e-learning and e-library

Cyber crime is a newly born disease in the form of crime that has emerged due to computerization of various activities under the networking age. The role played by Internet as a vehicle for the dissemination of computer viruses. Today much concern is to what the European Commission has referred to as illegal and

harmful content on the Internet. Under the above some points mention below:

4.3.1 Cyber Fraud

The existing law has to be changed to cope with computer related fraud example hacking, malicious falsification or insure of software theft and software attack etc. The new law is also necessary to ensure data protection; and piracy under e-commerce and e-learning.

4.3.2 Computer hacking under law

(i) legal response to computer hacking, (ii) computer miss use Act (iii) concept of access, (iv) limits of authority (v) Ulterior intent offence: criminal attempts.

4.3.3 Un-authorized modification of data and computer virus

(i) logic bombs (ii) Trojan Horse, (iii) Trapdoors, (iv) Spoofing, (v) Data Dadding (vi) Salami Techniques (vii) computer viruses.

4.4 Protection and Enforcement of Copyright and Challenges of Internet

At every second, information is assembling into the dot come bandwagon, hoping to sake in quick, bulks, with Internet translating dissemination and communication of information on such a huge scale. It is obvious that unless an effective intellectual property regime is placed to protect the properties of such information, the growth of the internet can be stunted.

4.4.1 Infringement of Right of Authors on Internet

(i) Reproduction (ii) Distribution Rights (a) Linking to website (b) Framing and (c) Databases (iii) Public performance and display rights (iv) Derivative Rights (a) Caching and (b) Transmission right (v) Liability for copyright infringement (a) Direct infringing (b) contributory infringement and (c) Vicarious infringement

4.4.2 Computer Software Protection

The legal challenge, which is based and differ nation to nation as per their laws existing on the globe.

4.5 Internet: Regulation and problems of Jurisdiction

Another area of concern about the countries that are considering or have adopted their laws to restrict access to certain types of content through the Internet, emphasize different concern as a result of cultural social and political difference. The different law may impede e-commerce in the global environment.

Legislation is un-realistic if it is based on the expectation of always being able to monitor communication to find the real contents of people messages and files. During the fresh developments in encryption it is almost impossible for the authority to view the contents of communication for their authenticity. People can't be forced to reveal decryption keys and able to access unbreakable cryptographic software and further able to communicate, Store and display immense quantities of data with great ease and at negligible cost over the Internet. The knowledge are entering an era of extreme information fluidity, where proposals of regulation which assume that barriers may effectively block the flow of information or may enforcing of files or communication reliably discern their contents and un-realistic.

4.5.1 Jurisdiction over Internet

The Internet connectivity and increasing day-to-day function in video and teleconferencing, under law relating to simple concepts such as formation, performance and payment under contract or even jurisdiction over criminal acts.

Traditional legal system provides, that the transaction between the parties, when both are situated in distinct territorial jurisdiction and are governed either by the laws of country where the parties agree and will governed the transactions or by the law of that country in which the transaction is performed.

4.5.2 Electronic Contracts and Jurisdiction

It is an Internet contract and it is typically a contact that entered through the medium of Internet, by using www (click wrap contracts) or through exchange of email stating offer and acceptance of the term and condition of a particular transaction. It is only possible in the best way where laws are governed and follow strictly as far example e-Bay (USA & European countries).

5. CONCLUSION

Indian government given a fillip to cyber law under digital age by passing the IT Act 2000. But some issues are still needed their place under the Act. When it have wide range of ramification for the growth of e-commerce and e-learning etc. It does not touch the issue of media convergence, the era of convergence is the era of monopoly, and ultimately convergence will lead to only the few major bodies. In order to curb the creation of monopolies effective laws are must. The need to protect the financial interest of creators in order to encourage private investments to the economy and need to create a framework for every human being to create and:

(i) The technology follows law of accelerating return, not the law of diminishing returns,

(ii) Expending universe theory needs that the time span for technology will be shortened

(iii) Four C (Consortium for compensation for creative contents) policy and a Digital Library Act should be articulated and publicly debated in India, which can motivate the author and creator with the understanding of law for both users and publishers.

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COPYRIGHT: DATABASES

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ABSTRACT

Database as a concept has undergone a change after Internet has narrowed the distance for transacting business. Databases were initially seen primarily as stored information says, in the form of share prices, details of employees, products and such other information. Today the term databases constitute data stored in the World Wide Web, CDs, Multimedia products, network and so on. Both the quality and quantity of the data has gained a lot of significance with the development of knowledge sharing which evolved with computer era. One of the best ways of protection of databases is by adhering to Intellectual Property Right (IPR). In those databases, copyright vests as soon as a database or any data for that matter is created. The paper describes the copyright and databases in detail.

1. INTRODUCTION

In India a lot of discussion is on the IPR (Intellectual Property Rights). India is fastly continuing to progress towards economic enlistment and globalization through liberalized policy. This globalization has brought in a number of electronic resources in the library. These electronic resources are e-book, e-journals, online databases and other web resources on the net.

2. COPYRIGHT

As per common Law, Copyright is defined as the right to prevent publication. Some have extended the definition by saying that the

definition should include the right to prevent others from multiplying copies. As per Encyclopedic Dictionary of LIS copyright is now defined as, "the sole right in the case of unpublished works to produce or reproduce any literary, dramatic or musical work or any substantial part of a work in any material form what so ever, provided the author is qualified to hold copyright." Copyright in India are granted under the Copyright Act, 1957, as amended in 1983, 1984, 1992 and 1994 and the copyright rules. India's copyright laws are quite exhaustive and are in tune with the requirements of TRIP's.

3. COPYRIGHT AND DATABASES

A database as a concept has undergone a change after Internet has come in as a e-resources. Databases were initially seen as stored information says, in the form of details of employees in an institution, share prices and such other information. Today the term databases constitute data stored in World Wide Web, CDs, Multimedia products, Network and so on. The voluminous information being created now-a-days has highlighted the need for protection of databases. On account of this adequate protection of databases has become very important.

The object of such a protection is to ensure:
a) That the owner gets his right to protect the data adequately.
b) Accessibility of the data to al those who legitimately wish to use the same.
c) Prohibition of unauthorized use of data.

One of the best ways of protection of databases is by adhering to IPR. In databases, copyright vests as soon as a database or any data for that matter is created. The fact that "bits" of a new database can consist of pieces from other copyrighted material is causing a lot of concern among the academic community.

4. COPYRIGHT AND DATABASES OF ABSTRACT AND PUBLISHED ARTICLES

Two major questions which arise because of the fact whether abstracts infringes copyright of original authors. They are

a) Do the abstract simply report the authors opinion.
b) Do the abstract substitute for the original texts.

5. MEANS OF DATABASE PROTECTION

Three broad approaches are identified by database for the protection of their property. They are:

5.1 Protection of databases through contracts

Protection of databases through contracts permits a user to use the database under a license from the database owner on payment of a fee, based upon the amount of usage and/or royalty.

5.2 Protection of databases through copyright laws

Many countries have accorded protection of databases under the copyright laws. Legal interpretations of a protection of databases considerably vary from one country to another. Many databases do not qualify basis conditions for being portable under the copyright law.

5.3 Sue generic system of protection for databases

Sue generic protection of database is largely guided for the European Community. The European Parliament passed a directing on 11th March 1996. A similar proposal, based on the bill (H.R. 3531) was also introduced in the 104th US Congress.

6. DIGITAL RIGHTS MANAGEMENT AND DATABASES

Today the ability to distribute copyrighted works in digital form through high capacity prerecorded disks and internet enabled transmission have brought new challenges to the protection of such content including databases from unauthorized copying and use. Besides IPR, Digital Rights Management (DRM) technology is a key enabler for the distribution of digital content and DRM refers to protecting ownership/copyright of electronic contact including databases by restricting the extent of usage of an authorized recipient is allowed in regard to that content. DRM has historically been as the methodology for the protection of digital media copyrights. DRM presents the opportunity to package, price, distribute and sell content in many new ways that have never been possible before. DRM of databases involve digital watermarking, Copy Protection Techniques (CPT), important legal developments and issues.

7. CONCLUSION

Copyright is something that affects digital content creators. We Indians should be conscious of its effect on the economy. It's not enough to have strong laws but strong mechanisms to enforce, like the judiciary police and the customs. It remains to be seen whether strict adherence to copyright law of databases is possible. If it is going to be meaningful protection, it has to be

done on a global basis through international treaties that all nations are prepared to recognize and follow.

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INTELLECTUAL PROPERTY RIGHTS: SOME VEXING ISSUES

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ABSTRACT

Advent of Information and Communication Technology (ICT), copyright laws were seen as a dull and almost irrelevant area of law relating to information provision. But with the use of ICT the copyright laws now have become central point and one of the most dynamic and fast moving areas of law. In the present scenario, IPR awareness is key to technological innovations and in the emerging knowledge-based economy; the importance of IPR is likely to grow further. The awareness among the creators of information and knowledge about IPR has become so imperative in the digital environment because in the digital environment it is becoming so difficult to proving rights violation when they occur. For legal experts, gathering evidence of digital crimes and to maintain its usefulness in a court of law are the greatest problems. Even browsing in a digital environment is a violation of 'Fair Use' as it is applicable only to printed works, and thus, amount to infringement. Of course, there is a need for Intellectual Property Rights and the laws should be made to protect the interest of the owner of creations yet there is also a need that the librarians should have the same kind of fair dealing arrangement as in the case of printed books. They should be able to read or browse electronic information without having to pay or it, preserve in digital format copyright material held in their collections, and fulfill inter-library loan and inter-library document requests electronically. Thus, the role of library and information scientists has become significant in the technological environment and they have to meet the challenge by sharpening their skills and should negotiate the same type of privileges as in the case of printed documents for accessing digital information. The paper deals with the issues pertaining to e-IPR and discusses them in the context of the changing scenario.

COPYRIGHT NEEDS RE-THINKING IN CYBER-ERA

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ABSTRACT

With the radical and rapid changes and advancement of technology, new legal issues have come up. This age of information has also given rise to grater concerns about Intellectual Property Right (IPR) legalities. Innovation and creativity play a major role in the creation of wealth and economic development of a nation. But due to globalization and liberalization of polices tough competition prevails in the World market. Therefore the importance and effective protection of IP is the need of the hour. It must be expressed in some discernible way for enabling it to be protected. To make control over the ongoing legislative debates on copyrights in the digital environment the intellectual community believes to put forth of some basic principles that would provide the standards for the enforcement of the rights. The paper attempts to address the basic limits to copyright protection, principles to be adopted, copyright infringement and the conundrums of copyright in digital era as well as to explore the new concerns for the protect.

ISSUES OF COPYRIGHT AND DIGITAL LIBRARY MATERIALS

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ABSTRACT

The introduction of digital libraries raise difficult and complex copyright issues that does not arise with traditional libraries. Rights management, intellectual property and copyright issues are legal aspects of digital libraries. Copyright issues are increasing unease among the members of library communities in providing digital collection and services. The problem for libraries is that, unlike private business or publishers that own their information, libraries are, 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. This is a great challenge, which needs to be changed by library community to provide effective information services.

Digitization of library collections has enormous copyright implications for libraries and this paper is an attempt to look at the same. The paper describes in brief the copyright issues specific to digitization of the literary works in the libraries are raised. Solutions may not exist for all the problems. Librarians will have to apply their mind and suggest to government modifications in appropriate laws to

enable them to avail of the opportunities offered by the new technologies in their mission of preserving the literary heritage of humanity and disseminating them to the public.

1. INTRODUCTION

Knowledge of copyright, intellectual property rights issues is of crucial important when linking electronic information to digital libraries. Advent of new technologies such as networks, digital libraries, electronic publishing, software advancements, satellite communication, wireless technologies, etc. are providing real challenges for copyright regulations and information technology offers new ways of disseminating variety of works. Internet and the digital revolution pose even more complex problems for copyright law. The three technological advances, namely, the digitization of information, networking and worldwide web have turned the economics of information upside down. "Digitization of information has changed the economics of reproduction; networking has changed the economics of distribution, and the worldwide web has changed the economics of publication. In all the three cases the changes have been seen because costs have sunk to unimaginable levels. As a result, a traditional assumption about copyright law has to be rewritten. If the early law of copyright was predominantly concerned with piracy caused by printing press, modern copyright law is predominantly concerned with the ease with which copyright works can be replicated in the digital medium." (Sahoo and Rao, 2003)

Creating effective digital libraries and providing digital information poses serious challenges for existing and future technologies. The integration of digital media into traditional collections is not straightforward, like previous new media (e.g. video, audio tapes), because of the unique nature of digital information – it is less fixed, easily copied and remotely accessible by multiple users simultaneously.

2. COPYRIGHT

Copyright is part of a wider group of rights known as 'intellectual property', which also includes designs, trademarks and patents. Its definition as a property right is significant because, as with other property, copyright can be bought, sold or transferred to another. Copyright gives the owner the exclusive right to activities

such as copying the work and issuing copies of the work to the public, although the exact wording varies between countries.

3. DIGITAL COPYRIGHT

Laws that are presently used to protect the creators and vendors of digital information often predate the development of computer technology, and it is not clear which laws apply to digital information. Ways in which digital information differs from information in more traditional forms include (OTA, 1994):

(i) digital works are easily copied, with no loss of quality

(ii) works can be easily transmitted to other users or be accessed by multiple users

(iii) works that are treated differently under current copyright law are essentially equivalent: text, video, audio are all series of bits

(iv) works are inaccessible to the user without hardware and software tools for retrieval, decoding, and navigation

(v) material can be searchable, linked, and interactive

Cryptography can provide new means of protecting intellectual property in the digital world. However, this raises other important ethical and sociological issues: should there be free copies of information available for lend in libraries? If so, what prevents all users to take a free copy of the work?

4. ISSUES IN DIGITIZATION OF COPYRIGHT WORKS BY LIBRARIES

While the contours of copyright law has always been drawn by the developments in the technological world, the emergence of digital technologies towards the concluding decades of the twentieth century as the defining paradigms of new age communication raised a whole new set of challenges to copyright regimes. The traditional notions of the basic concepts of copyright such as rights of reproduction and distribution have become inadequate and even irrelevant in the digital era. A host of intangibles have arisen in the world of `property incorporeal'. All works can now be digitalized whether they comprise texts, images, sound or diagrams and once digitalized the various elements such as images are all `equal' and can be merged, transformed, manipulated or mixed to create an endless variety of new works. Earlier, rights of reproduction and distribution affected tangible

physical copies only of a work. The new technologies brought in non-material reproduction and distribution. Physical reproductions were replaced by digital reproduction. To meet the challenges posed by the new technologies, major changes have been brought in a number of copyright laws around the world including that of the United States of America. The main thrust of these amendments is to state in unambiguous terms that copyright laws extend to the digital world as they cover the analogue world. So far as Indian Act is concerned many amendments were introduced in 1994 and 1999 to meet the problems posed by the growth of technologies and further amendments are under consideration of the government.

Digitization of a literary work is the process of converting that work into binary language and storing it in a computer memory. In other words it is storing of a work in a different format from printing on a physical medium. The definition of reproduction in the Copyright Act covers this process. As per section 14 (a) (i) of the Act of reproduce the work in any material from including the storing of it in any medium by electronic means is the exclusive right of the copyright owner. Therefore digitization is the exclusive right of the owner of the copyright. That is to say, digitization of a work without the permission of the copyright owner is an infringement unless it is covered by the exemptions provided under Section 52.

A Library should take care to ensure that its collection since ownership of physical copy of a book or document does not give the library the ownership of the intellectual property contained in that book or document. It should see whether it has the legal right to digitize a particular volume it has in its stock.

The copyright implications and also the issues are not uniform for all stocks in a library. From a copyright angle the stock of a library can be divided into the following:

4.1 Works in the copyright regime

4.2 Works in the public domain

4.1 Works in the copyright regime

Works in which currently copyright subsists. Examples are works of authors who are still alive or whose death occurred during the last 60 years. Works in which the first owner is an employer but which were created/published during the last 60 years also come under this category. Anonymous works published for the first time during the last 60 years will also fall in the category.

Reproduction of works in the copyright regime requires permission of the owner of copyright unless specifically exempted by the Act itself. The works reproduction of which will not be an infringement as per the Copyright Act are the following

(i) Matters published in any Official Gazette except an Act of a Legislature

(ii) Any Act of a legislature subject to the condition that such Act is reproduced or published together with any commentary thereon or any other original matter

(iii) Report of any committee, commission, council, board or other like body appointed by the government if such report has been laid on the Table of the legislature, unless the reproduction or publication of such report is prohibited by the government.

(iv) Any judgment or order of a court, Tribunal or other judicial authority, unless the court prohibits the reproduction or publication of such judgment or order, the Tribunal or other judicial authority, as the case may be.

4.2 Works in the public domain

These are works whose copyrights have expired at the end of the period prescribed by the law or works the copyright of which were relinquished by the author as per Section 21 of the Copyright Act. Examples of works in the public domain are works of William Shakespeare, Sarat Chandra Chatterjee, Rabindranath Tagore, nineteenth any early twentieth century publications by government and so on. Libraries can freely reproduce these works. Therefore for digitization of such works they need not seek copyright permission.

Another set of copyright issues arise after the digitization. Case laws differ on whether the new product in a digital format acquires of copyright of its own. Some hold the view that the format is a new expression and is entitled for copyright protection. In that case the library gets a copyright over the digital format, unless as per the conditions of the permission by the owner the copyright goes to the original owner or some one else. In both the cases the copyright owner in the new product will have to take measures to protect the same.

The following is a list of activities that a library or its user may perform in the digital environment but which could possibly infringement copyright.

(i) Copyright of a copyright work by library users
(ii) Copying for users and inter-library loan by the library itself
(iii) Performance to the public of a video or CD containing copyright material
(iv) Creating an electronic collection of copyright works and electronic document delivery

Once the collection is digitized, libraries would like to make that collection accessible to remote users and/or set up an electronic document delivery service. This leads to a host of new problems as copyright owners hold the view that provision of such access comes in conflict with their right for a normal exploitation of their work.

Protection of digital copyright is a very difficult proposition, the main reason being the ease with which a digital work can be copied compared to a work in the print format. By the click of a button a whole document can be copied in a matter of seconds or even nano seconds. Therefore copyright owners use various technological measures to protect their works in the digital format. These include measures such as encryption, watermarking, copy control flags, macro vision and so on Libraries may have to consider using such technologies to protect their own copyrights.

5. COPYRIGHT ISSUES IN DIGITAL LIBRARIES

Information is increasingly being captured, processed and produced in digital form in recent times. Digital information can be copied at almost zero cost–at lightning speed, and without any loss of quality–making information available in digital form can be unattractive both for authors and distributors. A key problem in electronic publishing is that current legislation does not deal with the intricacies of computer-based, networked systems, resulting in many gray areas. In some cases, strict application of law in its current form can even result in severe restrictions that eliminate advantages brought by technology. Of course, it is possible to reinterpret existing law in its application to intellectual works in a digital networked environment. Organizations often lack the intellectual property rights and permissions to the materials they

hold. Permission seeking for selected materials begins immediately after selection. One of the serious problems in creating digital libraries is to acquire copyright permissions.

5.1 Fair Dealing in an Electronic 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 use" instructions given by JISC and PA <http://www.ukoln.ac.uk/services/elib/papers/pa/fair/intro.html>.

5.1.1 Fair Use

Any incidental copying to disk involved in the viewing of part or all of an electronic publication:

(i) 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.

(ii) It is fair dealing for an individual to print onto paper one copy of part of an electronic publication for research or private study.

(iii) A librarian can print onto paper one copy of part of an electronic publication at the request of an individual.

(iv) One can accesses 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.

(v) The librarian should not give the user a print out of whole of an electronic book but can provide one chapter.

(vi) 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

(vii) One can't download an entire electronic journal or an issue to his PC. It needs permission from the copyright owner.

5.1.2 Not Fair

(i) To scan the article into electronic form. It needs the permission, if granted, would cover whether the library could retain a copy permanently.

(ii) 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

(iii) All the articles of a 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.

(iv) To post part or all of an electronic publication on a network or WEB site open to the public.

(v) 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. HOW TO PREVENT INFRINGEMENT IN DIGITAL ENVIRONMENT

Following methods can be followed in order to prevent the unauthorized use of the digital information:

When a librarian makes a copy on behalf of an individual, the practice of having the individual sign a form indicating the copy is for research or private study should continue.

Such a form might be paper-based, or electronic, if reliable authentication tools are in place.

A digital library can be protected by a password or the IP based authentication. Here the library user only can use the library collection. It restricts the unauthorized user for misuse of library.

Watermarking may be sought as one solution. "Watermarking has been used since the early days of paper making for security, to

denote paper quality or as a subtle promotional technique. There is usually no attempt to denote document validity. Digital watermarks differ from printed ones because they are usually hidden from the user and can be applied to several different types of media-text, images and sound" (Prasad, 2000).It is concluded that digital watermarking shows insignificant promise as a method of protecting electronic intellectual property that is available on the Internet. Royan (2000), for instance describes the use of digital watermarking in the Scottish Cultural Resource Access Network (SCRAN) Project in Scotland. SCRAN is a not-for-profit company involved in the creation and delivery of the networked learning, and in the management of the IPR. Royan (2000) comments, "Perhaps the single greatest obstacle to the creation and use of digital content is uncertainty over copyright issue, and in particular a fear that the new technologies may facilitate intellectual property theft". "Another example of the use of digital watermarks is at Digital Islamic Library in Malaysia "(Tedd and Large, 2004)

There is wide variety of software, which can be used for Watermarking like Digimarc, SysCoP, Signun Technologies etc. there are software, which can change Watermarks, for example, StirMark.

To protect the images, there is software called SafeImage, which uses JAVA technology and disables the save option of computer. This seems to be fantastic idea in sight. This is not a full proof of method because whatever is browsed from computer stays in the cache and there are browsers who can browse the caches of computer and thus document can be retrieved.

When libraries scan and transmit copyright materials to each other under the fair dealing provisions, more than one copy of the material will exist at some stages of that process. This is an inevitable result of the technology, and so could not rationally be considered as a breach of copyright. However, for the process to fall within fair dealing there ought to be auto deletion of all electronic copies, except the one to be used by the individual for personal research and study, at the end of the PC-to-PC transmission process.

7. ISSUES FOR DISCUSSION

Awareness of copyright and other intellectual property rights is growing in the society and, therefore, Librarians will have to think of the intellectual property issues that may affect the working of

libraries and make suggestions to the government so as to facilitate appropriate legislation. A clear understanding of the law is necessary for them, particularly in the context of digitization to ensure that the activities by a library, even inadvertently, do not result in infringement of copyright. They will have to examine the existing legislative framework in order to see whether they create handicaps in the primary objectives of public libraries and, if so what are the amendments required. It must be remembered that libraries and their patrons have a rave a right to expect that the digitization of public domain material can be performed without copyright restrictions that government publications and public domain material in electronic format is available without copyright restrictions and that in the case of copyright material the conditions of access and use are not unduly restricted or prohibitively expensive. Keeping in view the objectives of setting up public libraries and in view of the requirement of spreading literacy and education in the country, public libraries should be able to use electronic technologies to preserve their collections, whether they are in the public domain or in the copyright domain, to provide on-sit access to the digitized material, and to provide copies of reasonable extracts of the material in electronic and paper from for legitimate non-commercial use. Librarians, therefore, need to study the law keeping these requirements in view and examine how far the existing law facilitates this task of providing service to the people. The responsibility for advising academic and other support staff about the most appropriate and legal, use of digital resources frequently falls to librarians. They also often have to answer general queries about copyright. "***Librarians are clearly not lawyers***, however, as a librarian it is not uncommon to find that what you know about copyright is an awful lot more than many of your users will know! Copyright and the Internet is increasingly an international issue." (Secker, 2004)

Some of the questions that librarians can consider in the context of digitization of their collections from a copyright angle are:

i) Should libraries plead for a provision that will enable them to digitize all their stocks and preserve them as digital copies purely for archival purposes or as an insurance against loss of the physical paper copy? If so, how many copies a library should be allowed to make and what should be the safeguards to ensure that the digital copies do not go out of the system?

ii) Should libraries have enabling legislations to allow transmission of such digital copies between them?

iii) In there need and justification for a law that will enable the libraries to take hard copies of such digital copies of works in the copyright regime and issuing the same to their members?

iv) How far the provision "the making of not more than three copies of a book (including a pamphlet, sheet of music, map, chat or plan) by or under the direction of the prison uncharged of a public library for the use of the library if such book is not available for sale in India" [Section 52 (1) (o)] can held a librarian in digitizing such a book?

v) What are the special privileges (in the form of acts not considered infringements under the law) that libraries should have to provide quality service to its patrons?

vi) What are legal safeguards required for a library to provide the lending service on line?

This is not an exhaustive list but an illustrative one to show the need for librarians to take a more serious view than hitherto of copyright issues. It is worth recalling that the American Library Association has been playing a very significant role in the drafting of the copyright legislations in that country. In the UK, JISC has recently commissioned a study to investigate the digital rights management issues affecting the higher and further education communities <http://www.jisc.ac.uk/index.cfm?prog_middss_ studies>. Similarly in the Netherlands, the SURF Foundation has also recently commissioned research in this field (<http://www. surf.nl/en/>. JISC and SURF have combined force to launch a joint project in June 2004, entitled Copyright Doesn't Stop at the Border (JISC/SURF, 2004). Strong international cooperation is needed to face the global challenges of secure networks and use of cryptography in private and business applications. Legal standards for electronic commercial transactions have not been fully developed and these issues have undergone little review in the courts (OTA, 1994). The whole notion of digital money has potential to shake the fundamentals of international trade.

Also currently developed mechanisms for protecting intellectual property rely more on ethics and technology than on internationally accepted laws. How should we handle digital derivative works and digital fair use? How do we protect digital information? Probably encryption will be the technical basis for

most intellectual property protection. As Nicholas (1995) has put it:" the information age is in a bit of a mess when it comes to understanding who may access what, when, how, and under the control of whom". Solutions to the above problems are not easy. May be librarians will have to sit with authors and publishers and discuss ways to enhance the utility and services of libraries in the digital age without unreasonably prejudicing the legitimate economic interests of the authors. This article cannot hope to answer all the questions you will encounter, but it should provide a good grounding in many of the major issues.

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INTELLECTUAL PROPERTY RIGHTS AND LEGAL ISSUES IN THE WORLD OF DIGITAL INFORMATION

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ABSTRACT

An attempt has been made in this paper to discuss the scope, definition, impact and characteristics of digital information and legal issues concerning Internet environment. Brief account of what, why of Intellectual Property Rights, copyright issues and nature of digital archives, preservation and fair use is also given. An over view of digital millennium copyright and term extension act, legal and policy research i.e. contact law, communication policy, privacy policy and policies in Indian context is presented.

1. INTRODUCTION

Increase in the number of users and their different needs have made the modern libraries apply new technology. As a result of this there is a increasing trend towards collection, organization, managing, protection and distribution of information in the digital form. This has greatly facilitated the task of resource sharing all over the world.

Nearly a century ago, Leo Tolstoy wrote: "Art is a human activity which is having purpose to transmit to others, those who have

highest and best feelings to which men have risen." Today, through the technological artistry of the Internet, men and women have the power to transmit others pictures, sounds, and information instantly to anywhere across the globe but with this power comes responsibility. Like more traditional forms of media, and, in some ways, unlike them, those who use and do business on the Internet must be careful not to run afoul of a broad range of legal restrictions.

The new creations of the human brain are known as intellectual property and require to be protected to generate further and better creative works useful to the society, because such creative works are in great demand in every field of human activity. Intellectual property laws are the nerve centers of the global order.

2. COPYRIGHT AND DIGITAL INFORMATION

Digital information leads to new kinds of information products and services, which in turn may require legal protection that is difficult to provide through traditional intellectual property law. Digital repositories pose difficult questions about authorship, ownership, and the boundaries among copyright-protected works. Difficulties are also arising with respect to the concept of derivative work the variety of ways in which digital information can be presented and accessed. Two areas that are particularly likely to generate important legal and policy questions are the status of temporary reproductions and derivative work rights.

2.1 Digital Archives

There are significant economic and legal issues to be resolved if archives and libraries are to act as digital archives during the term of copyright. Acquiring works after copyrights expire is clearly ineffective, as it is unlikely that most works will be available for acquisition, few digital (or traditional) works remain economically viable for 100 years, and thus available in the marketplace. Significant economic, technical, and legal issues need to be resolved if libraries and archiving institutions are to be as successful with digital information as they have been with hard-copy information. A task force on electronic deposit should be chartered to determine the desirability, feasibility, shape, and funding requirements of a system for the deposit of digital files in multiple depositories.

2.2 Preservation

Digital information is often stored on media with relatively short life spans because the medium itself degrades (e.g., magnetic tape)

or the relentless advance of formats, hardware, and software leaves behind orphan technologies. As a result, preserving digital information inevitably involves copying it to a new medium and/or format. If digital information is to be preserved, such copying will need to be permitted under the law. In some instances, literal copying may not be practical or desirable, and the information may need to be adapted for a new format. This migrating process goes beyond simple copying and might be construed as the creation of a derivative work, which will also need to be allowed under the law to enable preservation.

2.3 Fair use

The fair use exemption is a legal doctrine that is comprised of a four-factor test that must be applied to the use of the work. Each factor is weighed equally. Fair use is about balancing the rights of the copyright holder with the public's right to use the material. If a use can be classified as fair use, then permission is not needed to use the work.

(i) the first factor looks at the purpose and character of the use. Educational use weighs in favor of fair use and commercial use weighs against fair use.

(ii) the second factor looks at the nature of the work being used. Factual works are given less protection than creative works.

(iii) the amount of the work used is the third factor. Generally, a large amount weighs against fair use, whereas a small amount would be considered fair use. There is no magic number or percentage.

(iv) the fourth factor looks at the market effect. If the intended use would negatively impact sales of the work, then the use would generally weigh against fair use.

3. THE DIGITIZING DILEMMA

One of the major legal issues associated with e-reserves is the actual scanning or digitizing of materials. Copyright holders have the exclusive right to reproduce, distribute, and display their work. Digitizing and posting infringes on those exclusive rights. When a work is digitized, it is then reproduced. When it is posted, it is distributed. If the material is accessed in front of a group, which is certainly possible if someone accesses it in a library, then an argument can be made that the work has been displayed. Again it is the fair use doctrine that comes to the rescue. Linking to

materials is preferable to digitizing and scanning. At present, linking is still legal. The optimal situation is to link to materials either owned or licensed by the library. Licenses for databases and other materials that specifically allow use for e-reserves are the best route. Most contracts from vendors/publishers do not include this provision, but it is certainly a viable and negotiable issue. WebCT, Blackboard, or other course management software is an option that some universities use. The professor and librarian can collaborate in taking the responsibility of posting the materials. The liability shifts to the professor if the professor goes it alone. However, the institution very rarely escapes liability.

Access to e-reserves should always be protected through passwords or other means. It is also wise to limit access to only those students enrolled in the class. Campus wide access has the potential to impact the market for the materials, possibly changing the outcome of the fourth fair use factor of market effect. The material should be available for the duration of the course, be it a semester, quarter, etc. After the designated period has expired, the material should be removed or access denied.

4. DIGITAL MILLENNIUM COPYRIGHT ACT AND TERM EXTENSION ACT (DMCA)

The Digital Millennium Copyright Act 1998 adapted by US congress is the most comprehensive reform of copyright law in a generation. It takes copyright principles into the digital information age and establishes complicated rules that most users do not yet appreciate. The implications of the statute, however, will be great. This memorandum has detailed the history of the digital discussions and highlighted the key issues and the most important statutory provisions. Now, from overview to action, here in a nutshell is what the DMCA means for the library community:

4.1 Anti-Circumvention

The anti-circumvention regulations adopted by US Congress as part of the DMCA 1998 need to be clarified to be more technologically sound and more sharply targeted to the problems the regulations were designed to address. More legitimate reasons to circumvent access control systems exist than are currently recognized in the Digital Millennium Copyright Act. For example, a copyright owner might need to circumvent an access control system to investigate whether someone else is hiding infringement by encrypting a copy of that owner's works, or a firm might need to circumvent an access control system to determine whether a computer virus was about to infect its computer system.

Many members of the anti-circumvention committee thought that technologies with noncommercial significant purposes should have the same protection under the DMCA as those with commercially significant purposes. Freeware and shareware, for instance, are examples of technologies that do not generally have "commercially significant purposes" yet may have legitimate, socially desirable uses. These committee members thought that the anti-device provisions would be better phrased in terms of technologies having "no apparently legitimate purpose." In addition to the currently required Librarian of Congress study of some of the impacts of the Digital Millennium Copyright Act's anti-circumvention provisions, broader assessments should be conducted of the impacts of the anti-circumvention provisions of the DMCA as a whole. This broader review of the regulations is justified because of their unprecedented character; their breadth and widespread concerns about their potential for negative impacts on public access to information and on the ability of legitimate users to make non-infringing uses of copyrighted works, on research and development in security technology, and on competition and innovation in the high-technology sector. This review should occur periodically and should include a study of impacts of the anti-device provisions of the DMCA.

Many electronic works are distributed in encrypted form. The new anti-circumvention and access rules will encourage publishers to distribute digital works online, by CD, CD-ROM and DVD or in other formats, in encrypted or protected form by providing greater assurance that those who abuse access barriers will be subject to severe penalties. Legislators and content owners both hope that the severity of the penalties will discourage widespread piracy.

Most likely, the DMCA will ensure that more works come with licenses and with an obligation to pay for each use or access. This change could hit libraries particularly hard, because it will challenge the way in which libraries functions as the archive of our published history. Libraries must be prepared to review contracts for the acquisition of digital works more closely than ever before and bargain for full access rights (DMCA). They must be alert to limitations on access and use of works that are licensed.

4.2 Online Service Providers (OSPs) and Limitation of Liability

Creation of a new limitation of liability for service providers was perhaps the most complex task of the DMCA legislators. Balancing a myriad of interests and fashioning legislation for

technology, which are evolving, are no simple matter. Thus, the OSP limitation represents a very important contribution of the DMCA to copyright law. Also, its process - Congressional committee supervised negotiations may also serve as a model for preparing legislation on issues that require discreet balancing of concerns of contentious but politically powerful interests.

4.3 Copyright Term Extension and the Library Limitation

DMCA suggesting that libraries should be able to exploit works that have fallowed for decades should not strike one as an explosive proposal. Yet, the content community aggressively fought this notion to the very end, receding only as the legislation was poised to succeed or fail for another Congressional session. However, the unfinished business of the Term Extension Act remains the definition of "normal commercial exploitation." Meaning thereby the Copyright Office, through the vehicle of regulations, will help to determine the reach of the new exception that permits libraries to continue to freely use old works in the last twenty years of the extended year just like public domain works. For the library community, this is a vital concern, because maintenance of the public domain assures the role of libraries as archivists of history, not licensees of commerce.

4.4 Database

It is nevertheless necessary to point out that the dramatic proposal to establish database protection for collections of information primarily unprotected by copyright law could have a devastating impact on what librarians think of as "the public domain." A database bill would effectively create a new body of material comprised of facts, data and government works that could not be reproduced without consent. A new licensing regime would be created with broad implications for digital communications and scholarship.

Although the database bill was deleted from the final version of the DMCA, it is fair to say its progress was only impeded. A new version of the bill has already been introduced in the 106th Congress, H.R. 354. Recognizing that the House of Representatives adopted the measure twice, librarians cannot rest on their laurels. There is an urgent necessity to maintain effective political alliances that speak to the value of fair access to facts, data and government works for purpose of education, scholarship, research and teaching. Although legislators heard and agreed with many of the arguments of the library community, have no illusion: database is the number one priority of publishing

magnates like Reed Elsevier and West Publishing. They have made major strides in convincing Congress that protection of their investment in building and maintaining databases from theft is sound public policy.

This bill will be at the very top of the House Copyright Committee's agenda in 1999. House and Senate hearings will occur in the spring of 1999. Maintaining a strong library presence on this issue is vital, lest databases of facts, information and government work, becomes the next body of material removed from the public domain.

5. LEGAL AND POLICY RESEARCH AT THE INTERSECTION OF INTELLECTUAL PROPERTY

5.1 Contract law

With the proliferation of licensing as a mode of commercial distribution for digital information, courts will need to decide when and how licensing rules should relate to certain public policies, such as those favoring competition, innovation, and freedom of expression. It will take some time before courts reach any consensus on working out this relationship, determining which policies are fundamental and when public policy can or should override license terms.

5.2 Communications policy

Communications and copyright policies inevitably intersect because digital networks are communications systems. One example is an effort by some copyright industry groups to persuade the Federal Communications Commission to require broadcasters to include copyright management information in digital broadcasts. That information might encourage rights holders to distribute work (because its origin was labeled), thereby increasing access, but could also include, among other things, digital signals that tell a consumer's video recorder not to allow recording of programs.

5.3 Privacy policy

Information technologies generally make it easier for copyright owners to monitor an individual's use of a work. Copyright management systems in particular are designed for this purpose (e.g., to enable billing). Clearly, legitimate uses of this information exist, but the information can also be misused. The Digital Millennium Copyright Act contemplates this situation and provides

some limited protections for privacy concerns raised by digital technologies.

6. INDIAN GOVERNMENT POLICIES TO PROTECT COPYRIGHT

In the light of recent developments like granting patents for neem and turmeric products as well as a clone of Basmati rice (Taxmati), there is an urgent need to contest such issues and safeguard the interests of our society. Protection of intellectual property rights was one of the foremost and important areas towards discharging the commitments under the TRIPS agreement. In this context the government introduced some Bills, included Information Technology Bill 2000, Patents (Amendment) Bill, Trademark's Bill and Design's Bill, and Geographical Indication of Goods (Registration and Protection) Bill. Government of India also includes Intellectual Property Rights in Science and Technology policy 2003. Further, there were many old and archaic laws that need to be repealed or amended in tune with the changing scenario.

6.1 The Information Technology Act, 2000

The information technology Act, 2000 hardly addresses itself to the broader problem of protection and enforcement of Intellectual Property Rights (IPRs). The act provides for investigation, trial and punishment for certain offences like tempering with computer source documents lacking the computer system, publication of information which is absence, tampering with protected computer system, piracy, misuse, and faking of digital signature certificate. In fact the IT Act, 2000 merely provides a framework, a very sketchy one, for legal recognition of electronic documentation, storage of electronic-data, licensing of Cyber organizations etc. This act is designed to provide legal recognition to transaction carried out by means of electronic data- operations and other means of electronic communication, commonly referred to as " Electronic Commerce".

6.2 Science and Technology policy 2003

In the preamble of Science and Technology policy 2003, it is clearly mentioned that, the nation continues to be firm in its resolve to support Science & Technology in all its facets. It recognizes its central role in raising the quality of life of the people. Particularly of the disadvantaged sections of the society in creating wealth for all in making India globally competitive in utilizing natural resources in sustainable manner, in protecting the

environment and ensuring National Security. Recognizing the changing context of the scientific enterprise and to meet international problems in the new era of globalization, Government enunciates the IPRs in the science & technology policy 2003.

6.2.1 Policy objectives

To establish an Intellectual Property Rights regime which maximizes the incentives for the generation and protection of intellectual property by all types of inventors. The regime would also provide a strong, supportive and comprehensive policy environment for speedy and effective domestic commercialization of such inventions so as to be maximal in the public interest. To ensure, in a era in which information is key to the development of science and technology, that all efforts are made to have high-speed access to information, both in quality and quantity, at affordable costs; and also create digitized, valid and usable content of Indian origin.

6.2.2 Generation and Management of Intellectual Property

Intellectual Property Rights have to be viewed, not as a self-contained and distinct domain, but rather as an effective policy instrument that would be relevant to wide ranging socio-economic, technological and political concepts. The generation and protection of competitive intellectual property from Indian R&D programmes will be encouraged and promoted. The process of globalization is leading to situations where the collective knowledge of societies normally used for common good is converted to property knowledge for commercial profit of a few. Action will be taken to protect our indigenous knowledge systems, primarily through national policies, supplemented by supportive international action. For this purpose, IPR systems that specially protect scientific discoveries and technological innovations arising out of such traditional knowledge will be designed and effectively implemented.

Legislation with regard to patents, Copyrights and other forms of Intellectual Property will ensure that maximum incentives are provided for individual inventors, and to scientific and technological community, to undertake large scale and rapid commercialization, at home and abroad. The development of skills and competence to manage IPR and leveraging its influence will be given a major thrust. This is an area calling for significant technological insights and legal expertise and will be handled differently from the present, and with high priority.

7. ADMINISTRATIVE RECOMMENDATIONS FOR WEB SITES

The Web has been likened to the world's biggest copying machine. Because of the ease of downloading to disk, hard drive, or printer, intellectual property posted on the Web is subject to being easily copied in its digital entirety. Certain policies, if followed, will at least discourage simple infringement. First, the university should inform browsers of the university's claim of copyright by inserting an appropriate copyright notice on its Web site. This notice is no longer required by law to assert a subsequent copyright infringement claim, but it puts all Web site visitors on notice that permission is required for further distribution. Second, the copyright notice should appear at least on the home page of the university's Web site, but preferably should be included on every page (U.S. Copyright Office, 1999).

8. CONCLUSION

Intellectual property will surely survive the digital age. It is clear, however, that major adaptations will have to take place to ensure sufficient protection for content creators and rights holders, thereby helping to ensure that an extensive and diverse supply of IP is available to the public. Major adaptations will also be needed to ensure that the important public purposes embodied in copyright law, such as public access, are fulfilled in the digital context. The protection of IP is depending on major legislative initiatives because it is early in the evolution of digital intellectual property and much remains unknown. This is because of the yet-to-come evolution in the information industries, user communities and latest technologies and also because of the need for research and data collection to improve knowledge and understanding of the issues. Under such circumstances, major changes in legal regimes and public policy are ill advised.

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RIGHTS AND ISSUES OF COPYRIGHT AND LIBRARY MATERIALS

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ABSTRACT

Copyright laws protect intellectual property in creative expressions in the literary and artistic fields. Copyrights have emerged as legal responses to economic and ethical problems posed by technological developments starting with the invention of the printing press. Among the advancements in technology that have posed the greatest challenge to copyright regimes since the advent of printing technology is the digital technology. This paper is an attempt to look at the same. The paper present overview of the copyright law of India is given so as to facilitate a clear perception of the issues involved and describes the various rights and legal issues from copyright. The paper concludes with the limitations of copyright.

1. INTRODUCTION

The concept of copyright originated with the slogan "To every cow her calf; therefore to every author his copy", given by Irish King Diarmid in 6th century A.D. However copyright evolved as a result of the invention of printing which revolutionized the techniques of re- production" (Thairani, 1987). Gradually new technology of communication and diffusion has grown up. In the case of traditional books, the offset printings process and Photostat machines had created problems for copyright protection. Internet and the digital revolution pose even more complex problems for copyright law. The three technological advances, namely, the

digitization of information, networking and World Wide Web (WWW) have turned the economics of information upside down. Digitization of information has changed the economics of reproduction; networking has changed the economics of distribution, and the WWW has changed the economics of publication. In all the three cases the changes have been seen because costs have sunk to unimaginable levels. As a result, a traditional assumption about copyright law has to be rewritten. If the early law of copyright was predominantly concerned with piracy caused by printing press, modern copyright law is predominantly concerned with the ease with which copyright work scan be replicated in the digital medium.

2. INDIAN COPYRIGHT LAW

In India copyright is governed by the Copyright Act, 1957, as amended last in 1999, the Copyright Rules, 1958 as amended last in 1995 and the International Copyright Order, 1999 as amended in 2000. The Copyright Act provides the basic law so far as copyrights are concerned, the Copyright Rule contains the rules and regulations as well as various procedures and the International Copyright Order extends copyright protection to works of nationals of specified foreign countries.

3. MAJOR RIGHTS

The rights, which from the bundle called copyrights, can be broadly classified into two categories, viz. economic rights and moral rights.

3.1 Economic Rights

Economic rights are so called because "they imply as a rule that within the limitations set by the copyright law the owner of the copyright may make all public use of the work conditional on payment of remuneration." These rights enable the copyright owner to reap economic returns for his work. The major economic rights available in the Indian Copyright Act are explained in brief in the following sections:

3.1.1 Right of Reproduction

Right of reproduction is the most fundamental of all economic rights. The right envisages that copyright owner has the exclusive right to authorize the making of one or more copies of a work or of

a substantial part of it in any material from, including sound and visual recording. The most common kind of reproduction is printing an edition of a book. Storing of a work in any medium by electronic means is printing an edition of a book. Storing of a work in any medium by electronic means is also reproduction. The Copyright Act gave the right of reproduction to all classes of works.

3.1.2 Right to Issue Copies of a Work

Onerously the right of reproduction is of no economic value if the owner of copyright cannot authorize distribution of copies made with his authorization. The Copyright Act extends this specific right to all literary, dramatic, musical and artistic works. The right to issue copies of the work however does not extend to copies already in circulation. This means that once a copy of a work has been sold, the purchaser can dispose of it further without any specific authorization of the copyright owner.

3.1.3 Right of Public Performance

The Indian Copyright Act provides public performance right to literary, dramatic and musical works. The main criterion so for as this right is concerned is that the performance must be in public and not private. Where the borderline between public and private performance lies is to be decided by the courts according to the circumstances but it is generally agreed that a performance before a small invited audience whether in a home or in a hired hall is not public performance. The general public must have access to the performance to make it a public one.

The performance can be given `by any means or process'. This means that the performance need not be `live', but can be by means of phonograms or films.

3.1.4 Right of Communication to the Public

The copyright Act of India defines communication to the public as "making any work available for being seen or heard or otherwise enjoyed by the Public directly or by any means of display or diffusion other than by issuing copies of such work regardless or whether any member of the public actually sees, hears or otherwise enjoys the work so made available." An explanation to the definition states "communication through satellite or cable or any other means of simultaneous communication to more than

one household or place of residence including residential rooms of any hotel or hostel shall be deemed to be communication to the public."

3.1.5 Adaptation Right

This is covered by Article 12 of the Berne Convention. Effectively the right means the right of the author to authorize any alteration of his work. The Berne Convention has not defined what an alteration but speaks of "adaptations, arrangements and other alterations of the works." Our Act specifically provides this right to all literary, dramatic, musical and artistic works, and computer programmes. The Act defines adaptation with reference to each category of works as under:

"Adaptation" means

i) in relation to a dramatic work, the conversion of the work into a non-dramatic work;

ii) in relation to a literary work or an artistic work, the conversion of the work into a dramatic work by way of performance in public or otherwise;

iii) in relation to a literary or dramatic work, any abridgement of the work or any version of the work in which the story or action in conveyed wholly or mainly by means of pictures in a form suitable for reproduction in a book, or in a newspaper, magazine or similar periodical;

iv) in relation to a musical work, any arrangement or transcription of the work; and

v) in relation to any work, any use of such work involving its rearrangement or alternation.

In a broader sense this also includes the right to make cinematography film or sound recording in respect of a work although in the Indian Copyright Act right is separately provided.

3.1.6 Translation Right

This right is mentioned in the Article 8 of the Berne Convention. The Indian Copyright Act recognizes this right for all literary, dramatic and musical works. Translation means the expression of a work in a language other than that of the original version. In order to do a translation of a work protected by copyright you need the authorization of the copyright owner. The translation also enjoys copyright without prejudice to the rights of the original author. Therefore, in order to reproduce and publish a translation

you need the authorization of the copyright owner in the original work as well as in the translation.

3.1.7 Right of Commercial Rental

Another right, which is getting wider acceptance and also find mention in the Agreement on Trade Related Aspects of Intellectual Property Rights is that of commercial rental. This right is mostly extended to computer programs. Phonograms and cinematography films in whose case advancements in digital and other technologies have made copyright easy. This right is meant to control to some extent-unauthorized reproduction. The Copyright Act extends this right to computer programs, cinematography films and sound recordings.

3.1.8 Sale Rights

The Copyright Act also provides that owners of copyright in computer programs, cinematography films and sound recordings have the exclusive right to sell or offer for sale any of the work, regardless of whether such copy has been sold on earlier occasion. However, in the case of computer programs, now the principle of first sale exhaustion applies, after the 1999 amendment.

3.1.9 Resale Share Rights

In the case of resale for a price not exceeding ten thousand rupees, of the original copy of a painting, sculpture, or drawing, or of the original manuscript of a literary or dramatic work or musical work, the author of the work, if he was the first owner of such work, or his legal heirs, have a right to share in the resale price of such original copy or manuscript. This right is coterminous with copyright.

3.2 Moral Rights

Moral Rights are generally provided with a view to assert the authorship on a work and also to uphold the right of integrity, Moral Right stem from the fact that the work is a reflection of the personality of the creator, just as much as the economic rights reflect the author's need to keep body and soul together. The Indian Copyright Act provides this as special rights of authors to claim authorship of the work and to restrain or claim damages in respect of any distortion, mutilation, modification or other act in

relation to the said work which is done before the expiration of the term of copyright if such distortion, mutilation, modification or other act would be prejudicial to his honour or reputation.

Moral rights are independent of the economic rights and remain with the author even after he has transferred his economic rights. In the era of digital technologies, moral rights, particularly right of integrity, are very necessary to safeguard against misuse and distortion of an author's work.

4. TERM OF COPYRIGHT

Copyright is for a limited duration. While the Berne Convention provides for a minimum period of protection, which is life term of the author plus 50 years thereafter, national governments are free to provide a longer term of protection. In Europe and USA, the period of protection for works is like term plus 70 years. In India, original literary, dramatic, musical and artistic works enjoy copyright protection for the lifetime of the author plus 60 years if they are published within the lifetime of the author. The term of protection is 60 years since publication in the case of cinematography films, sound recordings, photography, posthumous publications anonymous and pseudonymous publication, and works of government and international organizations.

5. COPYRIGHT INFRINGEMENT

"Copyright is the mechanism for establishing ownership, it is increasingly seen as the key to wealth in the information age" (Mann, 1999). Any copying or duplication, adaptation, translation, public performance, communication to the public or broadcast done without the authorization of the copyright owner, or even where any work has been licensed or assigned any violation of the conditions of the licence or assignment constitutes copyright infringement. Any import of infringing copies also constitutes copyright infringement. Even such copies made outside India cannot be improved into India without infringing copyright where such copies, if made in India, would infringe copyright even if it may not be an infringement in the country of origin.

6. LEGAL ISSUES

The development of telecommunications and networking technology in this decade has made communication easier,

faster and effective. More so, the development of Internet in particular has revolutionized way in which we communicate and access information. It also has become a platform of communication and data storage not only for companies, but also for various research and development organizations, academic institutions, including libraries. However it has also given rise to various problems like, security, infringement of privacy; plagiarism and piracy.

6.1 Security

Security in the field of Information Technology is becoming one of the major concerns nowadays. If they report their losses to regulators or law enforces, then the focus of any investigation generally becomes the prosecution of offenders.

6.2 Privacy

Privacy is an elusive, value-laden concept, and it is hard to reach consensus on a definition. Academic literature includes contributions from many different disciplines addressing the real meaning of privacy. However, an international consensus does exist for those elements of privacy that relate to the collection, maintenance, use, disclosure, and processing of personal information. In the last twenty years, *fair information practices* have become an international standard for privacy. Virtually all privacy laws enacted around the world in recent years are an implementation of fair information practices.

6.3 Cryptography

Cryptography means the discipline which embodies principles, means, and methods for the transformation of data in order to hide its information content, establish its authenticity, prevent its undetected modification, prevent its repudiation, and/or prevent its unauthorized use.

6.4 Authenticity

Authenticity is, therefore, of concern for both information providers and information users throughout the entire research process. Researchers are concerned about identifying and assessing the integrity of a particular source of interest.

6.5 Piracy

Piracy is the illegal copying of genuine programs, or the distribution of unauthorized imitation software products.

6.6 Plagiarism

"Plagiarism means using others' ideas and words without clearly acknowledging the source of that information. The presentation of the work of another person as one's own or without proper acknowledgment" (Concordia Undergraduate Calendar, 2003).

7. ADMINISTRATION OF COPYRIGHT

Since copyright is a proprietary right, the owner has to administer his own rights. The Copyright Act now provides for collective administration of rights through registered copyright societies. These societies have to be formed voluntarily by the copyright owners. Only the owner of copyright or the society who have the rights can institute civil and criminal proceeding against infringement of his works.

Civil remedies include injunction, and damages. Copyright infringement is a cognizable offence. Copyright infringement is punishable with imprisonment for a term ranging from six months to three years and with a fine ranging from Rs, 50, 000 to Rs. Two lakh. So far as computer programs are concerned there is an added provision which says that any person who knowingly makes use on a computer of an infringing copy of a computer program shall be punishable with imprisonment for a terms which shall not be less that seven days but which may extend to three years with a fine which shall not be less that fifty thousand rupees but which may extend to two lakh rupees. In India we have no separate courts for trying copyright infringement cases. Such cases are heard in the regular courts.

A copyright law is on par with other laws of the country and is enforced through police and ordinary courts. District Courts have been given jurisdiction into try the suits relating to copyright violation within the vicinity of which the owner of the copyright resides or carries on business. Owners can initiate civil and criminal procedures against infringe.

7.1 Foreign Works

India is part of the international copyright regime through its membership of Berne Convention for the Protection of Literary and Artistic Works, Convention Establishing the World Intellectual Property Organization (WIPO), Universal Copyright Convention, Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of their Phonograms, Multilateral Convention for the Avoidance of double Taxation of Copyright Royalties and Additional Protocol, and the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS). The Copyright Act has given the Government powers to extend copyright to foreign works. The government has done this though a separate order, namely, the International Copyright Order. This order extends protection to the works of those countries that are members of the international conventions of which India is a member. In extending the application of the provisions of the Act to foreign works as if they are Indian works, the principle of national treatment has been adopted except in the matter of term of protection. This is in accordance with the principles laid down in the Berne Convention.

8. LIMITATIONS TO RIGHTS

One can use any copyright materials without the permission of the copyright holder for the following reason (The copyright act, 1957):

(i) Single copy for private, personal or non-commercial use – research and study
(ii) Teaching
(iii) Quotations
(iv) Criticism or review
(v) Judicial proceedings

In other instances, the limitation takes the form of a "compulsory license" under which certain limited uses of copyrighted works are permitted upon payment of specified royalties and compliance with statutory conditions.

9. INFORMATION TECHNOLOGY ACT, 2000

The Department of Electronics (DoE) in July 1998 drafted the necessary bill. However, it could only be introduced in the House on December 16, 1999 (after a gap of almost one and a

half years) when the new IT Ministry was formed (1). The fundamental approach of the Act is towards validating and legalising electronic and on-line transactions. Business transaction costs will be curtailed and transaction volumes will grow manifold which involve the use of alternatives to paper-based methods of communication and storage of information. This is to facilitate electronic filing of documents with the Government agencies. Computer and Cyber Crimes will hopefully be curbed and offenders will be strictly penalised. Policing these crimes is extremely necessary. At the same time the officers who are given full powers under the IT Act must also be educated in computers and Internet. This would help them in executing their powers effectively and efficiently (Shah, 2000).

10. CONCLUSION

Copyright is an exclusive right conferred by the government on the creator of a work to exclude others from reproducing it, adapting it, distributing it to the public, performing it in public, or displaying it in public. Since copyright protects only original expressions and not ideas, and the test of originality in copyright is not as rigorous as in the case of other intellectual property rights, independent creations of similar works are quite possible, although the chances of two persons expressing the same thought in identical words or ways are well nigh impossible. The current regulatory mechanisms in India for computer information systems and digital environment work need to be amended and implemented properly. Hence the Laws should be clear, specific and understandable to guide the behaviour of all those involved in the transmission of data.

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