International Journal of Librarianship and Administration
Volume 1, Number 1 (2010), pp. 65-76

http://www.ripublication.com/ijla.htm

Role of New Technologies in the Library

Dinesh Kumar[1], Arjun[2] and Payare Lal[3]

[1]Associate Editor (International Journal of Library Science) & Library In charge
Pharmacy and Biotechnology Department
Punjabi University, Patiala, Punjab
E-mail: dineshpta@gmail.com
[2]Associate Editor (International Journal of Library Science) & System Administrator
Rajiv Gandhi National, University Of Law, Punjab, Patiala
E-mail: arjunpta@gmail.com
[3]Assist. Lib., Assist. Coordinator (DCS, P.U.)
Panjab University, Chandigarh.
E-mail: payarelal_1@hotmail.com

Abstract

"Libraries are not the exception to the influence of modern technologies which has converted the functional activities in all walks of life. Various institutions, organizations, business centers, banks etc. have gone into total change in its functioning due to technological change in the world.

The book Role of Information Technology in Library looks into application of technologies in libraries in terms of its management, library staff, study and training methods, development of library collection, use of electronic resources like CD-Rams, internet usage and assessment of computerized system for the betterment and speedy modernized library services." Computerization of library “housekeeping” operations is an important activity in this context. An electronic library is a heterogeneous system in which information is available in hard copy, on magnetic tape and discs, CD-ROMs and videodiscs, and also from online sources. Storage and copying of information are done either by downloading or by printing from a master file. Such libraries are can provide very diverse information; however, electronic libraries will evolve in an incremental fashion and, at least for the next few decades, we will operate in a dual paper-based and electronic environment.

Keywords: Digital Library, Information Technology in library.

Introduction

India has large advantages in the information race. It has a large higher education sector – the third largest in the world in student numbers, after China and the United States. Next to China, India is the most populated country in the world. The purpose of education is well-rounded development. Students need a combination of arts, computer science, science, and humanities or literature courses to achieve this kind of development. A well-equipped and well-managed library is the foundation of modern educational structure. It is said that education without library services is like a body without soul, a vehicle without an engine, and building with bricks but no cement. The library is the chief instrument for accumulating and using our intellectual heritage. Formal education can be conducted effectively and efficiently only with well-equipped libraries. Today, libraries are connected to vast ocean of Internet-based services. Electronic resources are developing rapidly. Academic libraries are the nerve centers of their institutions, and must support teaching, research, and other academic programmers. The situation in academic libraries in India is the same as that of academic libraries the world over; however, Indian libraries must provide maximum information with limited resources. Most higher education and research institutions in India are funded by the central and state governments. Those institutions have made a significant contribution to the transmission of knowledge and to research in all fields and disciplines. Universities and research institutes have played a leading role in transforming the country into a modern industrialized and technologically-advanced state. The green revolution and tremendous progress in dairy development have made India a major food-producing country. Its development of space technology, the production and launching of indigenous satellites, and the development of peaceful nuclear energy have brought it into the forefront of technologically advanced nations to which a large number of developing countries look for training and guidance. Indian universities and institutes of higher learning support the needs and aspirations of Indian students and scholars. The libraries of those institutions also play a vital role in acquiring and disseminating information for academic and research activities. Digital libraries are a way of making educational and research data and information available to faculty, researchers, students, and others at the institutions and worldwide.

Technologies

Digitization requires certain technologies. These include storage technologies—a variety of devices to store and retrieve information in digital form such as magnetic tapes/cassettes, floppy disks, hard disks, DAT Tape, CD-ROM, smart cards; processing technology—creating the systems and applications software that is required for the performance of digital network; communication technologies—primarily to communicate information in digital form; display technologies—varieties of output devices.

The explosion of information technologies has affected all operations of all libraries. Therefore adoption of new technologies becomes indispensable for the library. Library automation which started in late 70s in few special libraries has now

reached most of the university libraries. The word "Automation" was first coined by D.S. Harder (US) in 1936. Automation means computerization of library operation in order to improve cost effective performance with accuracy and efficiency. It provides access to information via national and international networks.

The library networking to aid information resource sharing and support activities in libraries has become a real necessity. The shortcomings observed are mainly related to two aspects:

- Non-availability of materials and services, and
- Efficient administrative control.

Today, A modern library should be indicative of the thrust required to be given to the application of modern information technology, which involves computer hardware and software, telecommunication, reprographic and micrographic equipment etc and the need to create and develop facilities thereof, otherwise it shall soon handicapped to have access to world information. It consists of the following:

- **HARDWARE:** Procure the server, UPS, Nodes with LAN card, Hub, etc according to the requirement of the library. Procurement of other input/ out put device s such as barcode scanner, scanner, printer, etc.
- **HUMAN WARE:** The old library staff must be sent for training or if needed well trained manpower must be appointing on provisional basis or on permanent.
- **STORAGE DEVICES:** Optical Storage Devices, etc.
- **SOFTWARE:** System software such as UNIX/LINUX, Window, etc. and application software such as SQL, Libsys/ Soul/ Koha etc.

New Technologies of Library Networking Systems

The UGC has played an important role in the improvement of university and college libraries. Realizing the value of the library and its role in higher education, the UGC accepted most of the recommendations of the several committees and commissions. UGC providing financial assistance for collection development, acquisition of books, periodicals, purchase of furniture and equipment, and construction of new library buildings. Working groups on information and library networks, modernization of library service and information centers, and the developmental programmes of NISSAT, NIC, DESIMET, ERNET, CALNET, DELNET and CIRNET have covered things like standardization of information handling, networks, and training.

Information and Library Network (INFLIBNET)

Information and Library Network (INFLIBNET) is a versatile, integrated library and information system created in 1991 to support teaching and research in higher education. The information and library network centre will network universities, institutions, colleges, and libraries affiliated to other organizations through UGC. It promotes automation, creates union catalogues, provides access to information sources, provides training, etc. INFLIBNET has developed "SOUL" (Software for University Libraries) software for automation in-house functions. SOUL and libsys

are installed at university libraries and has developed utility software packages for participating universities.

INDEST (Indian National Digital Library In Engineering Sciences And Technology)

The Ministry of Human Resource Development (MHRD) has set-up the "Indian National Digital Library in engineering Sciences and Technology (INDEST) Consortium" on the recommendation made by the expert Group appointed by the ministry under the chairmanship of Prof. N. Bala Krishnan. Besides 60 government or government-aided engineering colleges and technical departments in universities have joined the consortium with financial support from the AICTE. Moreover, the INDEST-AICTE Consortium welcomes other institutions to join. The INDEST-AICTE consortium is the most ambitious initiative so far. The benefit of consortia-based subscription to electronic resources is not confined to 38 major technological institutions in the country but is also extended to all AICTE-accredited and UGC-affiliated institutions.

INFONET

UGC has a consortium for e-journals through INFONET. It is uses the Education and Research Network (ERNET) infrastructure. On behalf of the UGC, INFLIBNET is executing the INFONET project in collaboration with ERNET. This consortium promotes the use of electronic database and journals by the research and academic community. INFLIBNET Centre is the nodal agency for coordination of INFONET. It facilitates linkage between UGC, ERNET, and universities and coordinates the programme. INFONET is a boon to higher education in India. The programme helps mitigate the severe shortage of periodicals faced by university libraries.

e-Journals in India

Most of the world's leading publishers have electronic journal (e-journal) access services at present. IIT Bombay (www.iitb.ernet.in/) subscribes to the full text versions of 222 e-journals covering a large number of publishers such as Elsevier, AIP, ACS, ASCE, SIAM, ASME, IOP, RSC, OUP, Wiley, etc. These are made available on their intranet. A list of 158 free electronic journals and magazines are also accessible through their site. IIT Madras (www.iitm.ac.in/) provides full text access to their clientele to the Science Direct service of Elsevier and the ACM journals, in addition to more than a dozen titles online. IIT Delhi Library (www.iitd.ernet.in/) has a much wider coverage of full text e-journals. These include Science Direct from Elsevier, IEEE/IEE Electronic library, American Physical Society, AIP, ASCE, Chemweb, etc. Their subscription to a group of eleven bibliographic databases called "Materials Science Collection" from Cambridge Science Abstracts (CSA) is another noteworthy service. TIFR (www.tifr.res.in/) has

the full text facility of all the Springer journals through the LINK service. Some of the CSIR Labs with their individual efforts have already established excellent facilities in e-library operations. Science Direct is already operational in four CSIR Labs i.e., National Chemical Laboratory Pune (www.ncl-india.org/), National Institute of Oceanography Goa (http://www.nio.org/), Central Drug Research Laboratory Trivandrum (www.cdriindia.org/).

INSDOC (www.insdoc.org/), the apex institution for Information System and Services under CSIR runs a Digital Library. The electronic library of INSDOC has a rich collection of about 3,500 foreign science and technology periodicals, including 1,123 full text journals. The Virtual Library operational at the Administrative Staff College of India (ASCI), Hyderabad (www.asci.org.in/) is perhaps a role model. The Indian Institutes of Management, in Bangalore (www.iimb.ernet.in/index.jsp), Calcutta (http://www.iimcal.ac.in/index.asp), Ahmedabad (www.iimahd.ernet.in/), and elsewhere, are currently in the process of evolving e-journal consortia for their group of libraries. National Center for Science Information (NCSI) Bangalore (www.ncsi.iisc.ernet.in/) plays a unique role in providing access, delivering service, and imparting education in electronic journals and bibliographic databases and a host of other related services/activities. The web-enabled databases/journals include Biosis, Medline, Compendex, Inspec, Mathsci, Current Contents, Adonis (Biomedical Journals), Cambridge Scientific Abstracts, Chemical Abstracts, Union Catalogue of Publications in Bangalore Libraries, etc. NCSI access to Un Cover provides free access to the content pages of over 16,000 journals. J-Gate (j-gate.informindia.co.in/), the e-journal portal for scholarly, research, and technical journals launched by M/s. Informatics India Ltd., Bangalore is a solution offered to institutions who do not have adequate expertise and resources for e-journals access at an affordable rate and in a customized package.

e-Learning in Digital Libraries

Most of our university libraries are now automated and many scholars have e-mail accounts. Communication and data transfer or interchange has become easy with the help of Internet and email attachments. The Inflibnet (web.inflibnet.ac.in/index.jsp) program for university libraries is expanding in every dimension. The concept of e-learning can be incorporated into a digital library system. For instance, in an e-learning environment the contents are truly dynamic. Any piece of information comes with a system that equips a user to test his level of knowledge. Libraries have adapted accordingly to enhance the learning process.

Other Networks

There are a number of other national networks and library networks, including NICNET (National Informatics Center's network), INDONET, CALIBNET (Calcutta Library Network), DELNET (Developing Library Network), etc. ADINET is associated with INFLIBNET, DELNET with NIC, and MALIBNET with CFTRI. A number of educational institutions are members of such networks. These networks,

especially DELNET are engaged in compiling union catalogs, creating databases of experts, providing training to library staff, ILL, online facilities, reference service, assistance in retrospective conversion, etc.

Technology on Library and Its Services

The advancement of science and technology has made a tremendous improvement and change almost in all walks of life. Especially the magnetic word information technology has been chanted in all corners of the global field. Libraries which were considered only as the storehouses of knowledge have got a new out look in the modern information communication technology period. The activates which were carried out manually in libraries with so much of pain and stain are being carried out smoothly with the help of Information communication Technology with greater effectiveness. Library organization, administration and other technical processing have become easier and more quantum of work can be done in relaxed mood. Information communication technology, which is the basis for the MBO, generates more results at a given time. University libraries are not the exemption from the impact of Information communication Technology. Such libraries are very much interest in incorporating the latest Information communication Technology in their administrative functions, technical works and user services. University Grants Commission liberally contributes the grants to the university and other affiliated colleges to install the Information communication Technology facilities and generate a digital environment. INFLIBNET is actively involved in the automation and digitalization of university libraries. Really the encouragement and cooperation given by the INFLIBNET by its various activates like funding, training, orientation, workshops and publication made the university libraries equipped with all Information communication Technology tools for providing better services to the students, researchers, and teacher.

ITS Services

The implementation of Information communication Technology in the libraries had demanded new forms of library services to get more user satisfactions. Digital library services have evolved after the implement ion of Information communication Technology in the library and information centers.

Digital Library

Digital library, electronic library or virtual library facilitates access to electronic information, print materials, and library services to ensure that the information needs of users are met regardless of their location. It enables libraries to deliver valuable information that already exists within library walls electronically to patrons outside those walls, to create new digital resources locally, and to integrate local digital resources with remote ones.

The terms such as “electronic library”, digital library”, “virtual library”, “web library”, or “online library” have been used synonymously to represent the same concept. Though the terms used synonymously to represent the same concept, the terms are used differently by different authors in the literature, the central theme of the terminology remains focused on digital content of the documents.

Digital Library: - The Concept

A digital library is a library in which a significant proportion of the resources are available in machine- readable format accessible by means of computers. The digital content may be locally held or accessed remotely via computer networks. In libraries, the process of digitization began with the catalog, moved to periodical indexes and abstracting services, then to periodicals and large reference works, and finally to book publishing, some of the largest and most successful digital libraries are Project Gutenberg, Ibibio and the internet Archive

Digital Library is the outcome of the prolonged research and development in the field which is more pertinent to the electronic collections and its management of identification, both micro and macro evaluation, selection, acquisition, resource sharing and document delivery. There is no homogeneous and globally accepted definition of a digital library. However, the electronic collections of information and record of the same through on-line and offline and also through various digitized collections such as CD-ROM, Floppy etc relate to the existence of digital library in broad sense of the term. Digital library is parallel at par with the electronic library and virtual library, which basically are concerned with the understanding and implication. The library which provides collections and services in the electronic form through video disks, CD-ROM can be termed as electronic library; the library which provides electronic collections and /or services can be understood as digital library; and the library which, without any physical existence is concerned with web site is known as virtual library (Rajashekar 1998;p,2) There libraries are nonentity by its establishment the digital library in the 21st century has become a vehicle for managing knowledge, information in a digital format which allows for interactive user interfaces and supports teaching, research and life long learning(Lupone;2000;p.30). Thus, the digital library, which is available in electronic form and is not virtually present in shape of marble edifice ; is transforming access to information. According to William Saffady, the digital library concept can be pertained to the following areas (Matson;1997;p.88).

(a) Machine-readable data files, often with scientific and technical application;
(b) Components of the emerging National Information Infrastructure;
(c) Various on line databases and CD-ROM information products;
(d) Computer storage devices on which information reside, such as optical disk, jukeboxes or magnetic tape autoloaders; and
(e) Computerized networked library systems.

Scope

The Digital Libraries available in various forms are restricted not only to the size of files, the format of content which are available in a structured form of software on CD-ROM including video clips, full length movies, but also extend its jurisdiction to rapid communication, Boolean search, browsing of information on Internet through World Wide Web.

Purpose

The Purpose of digital library is to facilitate access to electronic information, print material, and library services to ensure that the information needs of user community are met, regardless of their location. It enables libraries to deliver valuable information that already exists within library walls electronically to patrons outside those walls, to create new digital resources locally, and to integrate local digital resources with remote ones. The number of people accessing digital collections though the www also shows explosive rates of growth. Finally internationalization is maki9ng a “global information environment” a reality. The purpose digital library is to provide.

Advantages

The traditional libraries are limited by storage space while digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them. As such, the cost of maintaining a digital library is much lower than that of a traditional library. A traditional library must spend large sums of money paying for staff, book maintenance, rent, and additional books, Digital libraries do away with most of such expenditures.

The various Advantages of Digital Libraries are as follows:

(1) **No physical boundary**. The user of a digital library needs not to go to the library physically. People from all over the world can gain access to the same information, as long as an internet connection is available.

(2) **Round the clock availability.** A major advantage of digital libraries is the people from all over the world can gain access to the information at any time, as long as an internet connection is available.

(3) **Multiple accesses**. The same resources can be used at the same time by a number of users.

(4) **Structured approach**. Digital library provides access to much richer content in a more structured manner, i.e. we can easily move from the catalog to the particular book then to a particular chapter and so on.

(5) **Information retrieval.** The user is able to use any search term bellowing to the word or phrase of the entire collection. Digital library can provide very user friendly interfaces, giving click able access to its resources.

(6) **Preservation and conservation.** An exact copy of the original can be made any number of times without any degradation in quality.

(7) **Space**. Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them.
(8) **Networking.** A particular digital library can provide the link to any other resources of other digital library very easily and thus a seamlessly integrated resource sharing can be achieved.

Factors of the Digital Libraries

The environment in which library and information services operate is undergoing continuous change. Until 1980's libraries literally had a monopoly of provision of information. The users had to depend completely on libraries for information or publication they need. However the escalating quantity and cost of publications made it impossible to stock all the publications that their users want. Although the quality of collection and provision of services are still crucially important factors, the past decades gave seen great deal of change in the scholarly information provision. In addition to the greater flow of printed publications, a great increase in electronic sources gas taken place. Information and communication technology and digitalization of information resulted in considerable changes in library acquisition and delivery of service.

Virtual library may be characterized library of the future by four key aspects. In the first place it will be a gateway to information, whatever format these information comes in and wherever it is located. Secondly, because of the increasing complexity of information networks the library will be an expertise centre. Nevertheless, there will still be a pressing need for the library to be a physical entity , not only in the sense of being a social meeting place and place of scholarly interaction, but also as a place where students and other users are provided with modern study facilities and adequate user support . Furthermore, during the coming decades, the library will retain its importance as a collection centre of printed material.

To sum up, the factors that influenced towards development of digital library can be attributed to:

- Speed of information accessibility,
- Emergence of electronic resources,
- Escalating price of information sources,
- Demand from users for scholarly information,
- Information and communication technology, and
- Networking technology

Digital Library Services

Digital media capabilities bring significant opportunities for the library to improve access and the value; it provides from its collections, the digital library consists of critical mass of digitally geld documents- words, still images, sound and any combination of these. These documents may be geld in more than one place and their

provenance may be more than one institution. Provision of the documents will be subject to agreement with and, as required payment to copyright and intellectual property owners.

The digital library is the gateway to the exciting to the exciting new resources and networks that comprise the global information environment. It links from vast print collections to thousands of online texts, and from rare books to world wide networks.

Digital Library Services includes information about all the services, collections, digital resources, library instruction sessions and services. It identifies, evaluates, develops, and implements products and services that enable our members to develop and administer effective and useful digital resources. It also provides the tools, training, and consulting service librarians need for cost-effective data creation, data management, project administration, and standards implementation.

Through the digital library, Library can enhance the services provided to users, and also to reach new users, digital collections and services will supplement rather than replace the traditional collection and services. The specific services of digital library include providing remote access library resources-both printed and non-printed, service deliveries and generation information on library. Depending upon the by laws of regulations of the individual organizations, the access could be limited to members, or limited to certain resources like commercial databases, where only members can access them through password.

Products and Services of Digital Library

In the IT age, the development of computer technology gas reached to its apex more specifically in the networking field where, the world gas turned to a global village. Internet and the WWW technologies are providing a challenging technological environment and intellectual impetus for the development of digital libraries. The Internet could be able to establish a global connectivity of computers and the production of different indigenous products, tools, and techniques for networked information provisions and retrieval. The productions, which are in electronic from and stored in digitized bit form, include.

(a) Electronics Mail (e-mail)
(b) File Transfer (Ftp)
(c) Telnet (Remote Login)
(d) Gopher;
(e) WAIS and WWW for information/electronic publishing and access using the text coding standards such as Hypertext Mark up Language (HTML) and Standard Generalized Mark up Languages (SGML) where. SGML is a Meta language to describe markup language implemented through HTML.
(f) Electronic Journal (E-Journal);
(g) Electronic News (E-News);
(h) Table of contents;
(i) Preprints;
(j) Technical Reports;

(k) Software and data archives including Library catalogues, discussion forms, preferences sources, course ware, directories etc.

The E- publishing which is a successful venture of electronic age can be defined as the publication process where the manuscripts are transferred to electronic format and distributed to the users by employing computers and telecommunications. In the most sophisticated interpretation, the full capabilities of electronic media including motion, sound and interactive features are exploited in the creation of a completely new publication in Machine –readable form which are distributed on magnetic tape and video discs and can be accessed like any other database .CD-ROM, videodiscs and On-line bibliographies databases form a major part of E-publishing field. In the field of Telecommunication Technology , the Integrated Service digital switches and digital paths are used to establish a varieties of services such an videotext; E-mail; digital facsimile; Tele text; Database access; E-fund transfer; image and graphics exchange ;document storage and transfer; video conferencing etc.

Conclusion and Suggestion

Education is an important force in the advancement of civilization. Its success depends upon the sharing of information. Electronic libraries can provide a vehicle for extending collaboration, which is at the heart of the academy, with the aim of more effective education. The use of multimedia provides a much enhanced inter face between the user and information. The multimedia library will prosper with the growth of networks, increased use of computer and the cable television. Networks provide for wide spread remittances to central computer facilities. Access to audio and video players and an ever-growing capability to handle information from these sources shall also be enhanced by computer technology. For the multimedia library of the future, cable television offers the feasibility of transmitting images, such as pictures, diagrams, maps and other information for display on the reader's television receiver. It will help the user to be in charge of information flow freed from the whims of the librarians. Few suggestions are provided here to make multimedia libraries functional and progressive:

- Libraries should design proper training sessions for the users as well as staff in handling multimedia.
- Multimedia libraries should opt for marketing the information to raise their resources for better upkeep of services and computer infrastructure.
- Libraries should urgently arrange for conversion of printed documents to electronic media so as to make them usable in multimedia library environment.

References

[1] Cawkell, A.E., Multimedia: Hardware, Software, Costs and Applications. Critique 3(3) 1990.

[2] Dhanasegaran, G, Emerging Multimedia Technologies. In Multimedia; Its applications in Library and in formations Science. Edited by B.Satya Narayana ,etc Chennai, T.R. Publications,1998,p.153

[3] Ekbal, B. (2001) "Information Technology and Higher Education" XXIII IASLIC

[4] Gupta,R.C., Buildings research through CD-ROM,39th All India ILA Conference, Bengalore,1994.pp,416-17.

[5] Jebaraj, F. 2003. "The Electronic Library: An Indian Scenario". *Library Philosophy and Practice*. V5.N2. spring 2003. www.webpages.uidaho.edu/~mbolin/jebaraj.pdf

[6] Lee, Hur-Li. (1993). The Library Space Problem, Future Demand, and Collection Control, *Library Resources & Technical Services*, 37 (2), 147-166.

[7] Lewandowski, Dirk. "Web Searching, Search Engines and Information Retrieval." *Information Services and Use* 25 (2005): 137-147.

[8] Matha, K.Andhra, Impact of Multimedia on LIS. In Dhanasegram,G. op.cit.pp.87-92.

[9] Pream Singh and Dabas, D.S., Multimedia information and systems in libraries. In India libraries in I.T. Environment, by R.G. Prasher, Ludhiana, Medallion Press, 2003.pp. 88-102.

[10] Ravichandra Rao, I.K. (2000) Sources of Information with Emphasis on Electronic Resources. DRTC Annual Seminar on Electronic Sources of Information. 1-3 March 2000.

[11] Singh, A.P. and Harish Chander, Multimedia: a tool for information mapping. In Vistas in library, information Systems and Networks, by M.V.Vonugopol, etc. Agra Y.K. Publishers, 1999. Pp.101-105.

[12] Subba Rao, Siriginidi. (2001). Networking of Libraries and Information Centres: Challenges In India, *Library Hi Tech,* 19(2), 167-179.