DIGITAL LIBRARY: PROBLEMS & PROSPECTS IN INDIAN ACADEMIC ENVIRONMENT

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ABSTRACT

The digital revolution has brought dramatic changes to information storage, access, and retrieving processes. The creation of digital libraries has made an essential impact on the teaching and learning process. In this paper, we discuss about various aspects of Digital Library and initiatives in India as well as problems and prospects of Digital Library in Indian academic environment. We also point out here the role of Digital Library in learning and research.

Keywords: Digital Libraries, Digital Services, Academic Libraries, Information and Communication Technology.

INTRODUCTION:

Traditional libraries in the print based environment were guided by the objective of linking users who needed information to the sources that had the information. Most of their work was done without the use of information technology and was time consuming depending on the nature of the search. Nowadays the scenario has changed with greater use and application of information and communication technology (ICT) especially in libraries. As more and more information sources become available online, many university libraries are introducing Digital Library and Services. The aim of these services is to broaden the range of information resources available and to add value to their content by making them accessible through digital means so that students, researchers, and the entire members of the university community can access them anytime and anywhere. The development of the Internet and its associated Web technologies in the past decade have significantly influenced both the way libraries provide information services to their users and the way users choose to access information. Academic libraries are now trying to meet the needs of the academic and research community by improving their services and enhancing their resources. One of the means is the provision of digital library collection. A successful strategy to enhance exploitation of resources is to ensure users' awareness about the existence of a particular

service such as the current technologies in libraries which are meant to promote service efficiency and effectiveness.[1]

DIGITAL LIBRARY:

A Digital Library or Digital Repository) is a special library with a focused collection of digital objects that can include text, visual material, audio material, video material, stored as electronic media formats (as opposed to print, microform, or other media), along with means for organizing, storing, and retrieving the files and media contained in the library collection. Digital libraries can vary immensely in size and scope, and can be maintained by individuals, organizations, or affiliated with established physical library buildings or institutions, or with academic institutions. The electronic content may be stored locally, or accessed remotely via computer networks. An electronic library is a type of information retrieval system.[2]

DEFINITION:

A digital library is a library in which collections are stored in digital formats (as opposed to print, microform, or other media) and accessible by computers. The content may be stored locally, or accessed remotely. The first published use of the term may have been in a 1988 report to the Corporation for National Research Initiatives. The term was first popularized by the NSF/DARPA/NASA Digital Libraries Initiative in 1994.

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

The DELOS Digital Library Reference Model defines a digital library as: "An organization, which might be virtual, that comprehensively collects, manages and preserves for the long term rich digital content, and offers to its user communities specialized functionality on that content, of measurable quality and according to codified policies."

A digital library is not a single entity. It requires technology link the resources of many collections. The links between digital libraries and their resources are transparent to users. Digital library collections are not limited to document surrogates (bibliographic records. They are the actual digital objects such as images, texts, etc.[3]

TRADITIONAL LIBRARY V/S DIGITAL LIBRAY:

The contrast between traditional and digital libraries is presented below:

Traditional Libraries	Digital or Electronic Library
Print collection	All resources in digital form.
Stable, with slow evolution	Dynamic and ephemeral
Individual objects not directly linked with each other.	Multi-media and fractal objects
Flat structure with minimal contextual metadata	Scaffolding of data structures and richer contextual metadata.
Scholarly content with validation process	More than scholarly content with various validation processes
Limited access points and centralized management	Unlimited access points, distributed collections and access control
The physical and logical organization correlated.	The physical and logical organization may be virtually
One way interactions	Dynamic realtime dialogue
Free and universal access.	Free as well as fee based.[3]

WHY DIGITAL LIBRARIES?

Libraries have changed with time to time from mere static storehouse to dynamic service centers, serving all professionals and non-professionals utilizing useful need base collection. The emphasis of the users has also shifted from micro document to micro piece of information with the changed of the medium from clay tablets to paper and now to electronic and optical media. The worlds of both communication and production of information are changing at a very fast pace and the convergence of these had huge impact on libraries. All this changes in libraries is due to the impact of information technology and this impact is seen in the form of digital library. Due to information explosion during the last few decades many techniques and technologies have emerged for handling the information more readily, speedily and effectively. Many computer specialists also succeeded in integrating text, graphics, audio, animations, and video converted into a digital media. People feel enthused to read from computer screens. Varieties of software are now available which are capable of manipulating and rendering information. At the same time price of personal computers are getting cheaper and cheaper to a very affordable cost. Besides allowing remote access, bringing the diverse material together from scattered locations, solving space problems, raising the profile of institution, enhancing preservation, increasing in retrieval and dissemination of information in digital libraries system, people in the library professionals shows increased concern in building digital library. Dwindling budgets of library and high information demand are also another factor.[4]

NEED AND IMPORTANCE OF DIGITAL LIBRARY:

We are in the midst of information explosion and information technology revolution leading to the emergence of electronics information era. Rapid advances in information processing, storage and communication technologies have revolutionized the role of libraries worldwide in disseminating information services to their users. Libraries therefore, are reconsolidating their services and information products, incorporating new technologies of upgrading information resources, changing information objects, models of communication and information delivery in order to add value to their services and to satisfy the changing information needs of user community. In fact, impact of information technology on libraries and its users is an important factor for transformation of traditional organizational structure into new institutional entities. Information seekers are also no longer satisfied with the printed materials alone. As a result the users demand for information delivery in digital form, considered more dynamic in electronics multimedia documents, at their desktop are increasing day by day. Thus, there is a need to develop digital library and to adopt electronic media for its collection development so that it can fulfill the requirement of users. Libraries and other library professionals should make efforts for setting digital libraries and conversion of resources into a digitized format.[4]

FEATURES OF DIGITAL LIBRARY:

Some important features of Digital library can be summarized as:

- to introduce new service and material
- to provide remote access to information resources that are expensive and rare and easy searching that are impractical manually;
- to facilitate in the management of digital content
- to minimize in handling of rare and unique collection of traditional library
- to improve access to the latest information at a very high speed
- to support search and retrieval
- to provide users friendly interface
- to support formal and informal learning
- to reduce errors that would have occurred in the manual systems significally because of bar code
- cost effectiveness and affordable and
- to raise library profile
- Digital libraries as global multilingual expository of data must attract people from all walks of life regardless of geographical locations.[4]

TECHNICAL ARCHITECTURE:

Technical architecture is another factor that need enhancement for digital information service system. Therefore, libraries need to upgrade current technical architecture to accommodate digital materials. The architecture includes the following components:

- Local Network with high speed and fast connection to internet
- Full text search engines to index and provide access to resources
- Variety of servers (FTP and Web server)
- Electronic documents management functions that will support digital resources
- A variety system functions to coordinate mange the entry and retrieve data
- Local Library system with adequate PCs having LAN
- Well trained and manpower
- Relational databases that support a variety of digital formats.[4]

REQUIREMENTS OF DIGITAL LIBRARIES:

From the above discussion, it is essential to know about the following requirements of Digital Libraries:

1. **Digital Information Sources:** The digital libraries operate only on digital documents that are computer readable and network accessible documents. The e-books, e-journals, web based resources, etc are the information sources that are accessible through digital libraries.

2. **Computer Network:** Digital library is not single entity, but it is networked systems to search for the information seamlessly. For this purpose, there is necessity of computer systems and high speed internet connectivity or intranet facilities in the institutions (libraries).

3. **Expertise in Digitization:** Many of the academic libraries are functioning now on printed documents and if they would like to set up digital libraries, then there is need for infrastructure and expertise in digitization.

4. **Constant and Continuous Access to Documents:** The digital libraries, to be effective must have to update its collection from time to time. Further, it must provide 24x7 services to its users. The uninterrupted internet or intranet service is essential for successful functioning of digital libraries. For this purpose, higher level of technology is essentially needed apart from continuous and constant power supply.

5. **Information and Communication Technology (ICT) Professionals:** Librarians are not fully aware about the technological functioning of the digital information sources and latest technology. Hence, for providing continuous services from the digital libraries, there is need for ICT professionals in the libraries.[5]

THE ROLE OF DIGITAL LIBRARY IN LEARNING AND RESEARCH:

The digital revolution has brought dramatic changes to information storage, access, and retrieving processes. The creation of digital libraries has made an essential impact on the teaching and learning process. Digital libraries facilitate information services for students, independent of time and place. This is much needed, especially if active learning styles become a common place. The major benefits of digital libraries include storing resources in digital format, which allows online access to students at numerous locations at anytime and anywhere, it can be at home, in the library, in the class, laboratories, to mention among many. Moreover, digital libraries provide various search techniques to access the digitized resources. A digital library is a collection of information objects and services that support students in dealing with information objects available directly or indirectly through electronic or digital format. Digital libraries containing representations of original works provide opportunities for students and scholars to conduct research from their personal computers and workstations set in their homes, offices and laboratories. It also facilitates remote research from private and public locations and offers learners' opportunities that are unconstrained either by the limited resources found in particular physical libraries or by their schedules of operation.[1]

DIGITAL LIBRARY INITIATIVES IN INDIA:

India is in the experimental stages of digital libraries. Barring the Health Education Library for People (HELP), Mumbai, the Tata Institute of Fundamental Research (TIFR), Mumbai, IIT Kharagpur, and National Centre for Science Information (NCSI), Bangalore, a majority of libraries provide bibliographic access only. IASLIC-LIST and the LIS-FORUM, along with the electronic newsletter, INFOWATCH provide professional information. *Information today and Tomorrow* , *INFLIBNET Newsletter* , and the *DESIDOC Bulletin of Information Technology* (D-BIT) are a few other sources of current information on the use of ICTs and networks in India. Research and development activities regarding digital libraries are being undertaken in some institutions, for example, at the Education and Research network (ERNET) of Department of Electronics, GoI (http://www.doe.ernet.in) and the electronic library being developed at the Indian National Scientific Documentation Centre (NISCAIR), New Delhi (http://www.NISCAIR.org). A brief account of some of the resources and services is presented below.

- Searchable databases on the web from Central Library of Indian Institute of Technology, Kharagur (IIT-Kgp) (http://144.16.192.18 or http://libweb.iitkgp.ernet.in)
- Digitization at IIT-Kgp Library initiated at the beginning of 1990s. IIT-Kgp is one of the six premier institutions of quality education in engineering and technology, the Indian Institute of Technology (IITs).
- Electronic current awareness bulleting 'Infowatch' beginning in July 1996 by the University Grants Commission (UGC). (http://144.16.72.150/ncsi/iw.html)
- LIS-FORUM, a discussion forum sponsored by NCSI, Bangalore. (http://144.16.72.150/ncsi/services/lis-archive.html)

- Development of OPACs in many libraries such as Centre on Rural Documentation CORD of National Institute of Rural Development (NIRD), Hyderabad (http://www.nird.org/clic/index.html and http://www.nird.org/clic/L.html)

- Index of *Hitesranjan Sanyal Memorial Collection (HSMC)* at the Centre for Studies in Social Sciences (CSSS), Calcutta. (http://www.iisg.nl/asia/cssc.htm and http://www.socialsciencecal.org)

- Health Education Library for People (HELP), in Mumbai. HELP is a privately managed site providing health related information and managing an online catalogue of over 15,000 documents (http://www.healthlibrary.com)

The situation in India regarding digital libraries is very peculiar. Many government agencies, as well as institutions, mostly in the public sector, are engaged in some sort of work regarding the digitization of libraries. Examples clearly indicate that the potential of ICTs for developing digital libraries has not been fully realized by the Government of India. While one government agency is providing support for one particular aspect, the other is focusing elsewhere, without any coordinated effort by a nodal agency.[3]

PROBLEMS & PROSPECTS OF DIGITAL LIBRARIES IN INDIA:

The digital libraries are successful, if they are providing all the services to all the types of users. Considering constant development of ICT, many of the librarians, information scientists, teachers, etc are seriously thinking about the future of the technology and its impact on conventional or digital libraries. According to many of the thinkers, digital libraries will be developed in India within few years. But, these experts must have to turn their attention to the other factors, which are essential to determine the nature of the academic libraries. These factors are discussed as under.

1. **Nature of Users:** Dr. Ranganathan long back emphasized that the libraries must give much attention to the nature of users, their information requirements, their approaches for searching of information, etc. In case of most of academic libraries (except university libraries), the users are interested to study only curriculum based learning rather than research oriented learning. Hence, considering the interests of the users in schools and colleges, it is essential to collect and maintain printed materials.

2. **Nature of Information:** Majority of the users be it faculty or students in schools and colleges need information pertaining to their syllabus rather than research and developmental learning except few users. As such, conventional printed documents are more useful rather than digital forms of documents.

3. **Information Economy:** The academic libraries levy fees from students to provide library services and such fee is affordable to all the students now. As such, digital libraries must have to collect fee from its users. In case of printed documents there is one time payment to publishers to purchase books and journals, but in case of e-books, e-journals, etc the digital libraries have to pay the charges frequently (generally annual). Further, there is also need to upgrade the technological applications constantly and continuously and it makes the services of the digital libraries costlier compared to printed libraries. On the other hand, the users must be able to bear the fees charged by digital libraries. It is highlighted that

still considerable population in India is living below poverty line. The average per capita income of populations is Rs 54,000 in 2010-11. It is noted that about 27.5% of the population was living below the poverty line in 2004-2005. About 21.92% percent of Indians are extremely poor. Even as revealed by Wikipedia, in 2005-06, the average income of a family was Rs. 368 per month in rural areas and Rs. 560 per month in urban areas. Income-based poverty lines consider the bare minimum income to provide basic food requirements; it does not account for other essentials such as health care and education. To gain services from digital libraries, apart from paying higher fees the users must have to spend for technological tools such as computers, internet connectivity, storage devices, etc. Hence, it is not affordable to all the users to access and use digital libraries.

4. **Literacy and Computer Literacy:** As per the Census of India, 2011, there is total population of 121 Crore in India. Of which, 77 Crore (74.04%) population are literates and 44 Crore (25.96%) population are illiterates. Further, Computer literacy is lowest in India. Computer literacy is defined as the knowledge and ability to utilize computers and related technology efficiently, with a range of skills covering levels from elementary use to programming and advanced problem solving (CMA, 1984). Computer Literacy in India is certainly very low, as 6.15% (Yahoo, 2008). The Statistics about Internet usage and penetration in India (2010) reveals the following:

- 1,173,108,018 (1.1 billion) population and 88,000,000 (88 million) active Internet users in 2010.
- Total of 6.9% penetration rate (6.9 persons using Internet out of 100)
- India has 10.52 million broadband users (till Oct.2010), constituting only 6.0% of the total population.

5. **Power Supply:** As discussed already, the digital libraries must have to provide 24x7 services to its users. On the other side, the users have to access information from digital libraries on all times. For this purpose, there is basic need for constant and continuous power supply. Wikipedia revealed that in December 2011, over 300 million Indian citizens had no access to frequent electricity. Over one third of India's rural population lacked electricity, as did 6% of the urban population. Of those who did have access to electricity in India, the supply was intermittent and unreliable. In 2010, blackouts and power shedding interrupted irrigation and manufacturing across the country. During the year 2010–11, demand for electricity in India far outstripped availability, both in terms of base load energy and peak availability. Base load requirement was 861,591 (MU) against availability of 788,355 MU, an 8.5% deficit. During peak loads, the demand was for 122 GW against availability of 110 GW, a 9.8% shortfall. In a May 2011 report, India's Central Electricity Authority anticipated for 2011–12-year, a base load energy deficit and peaking shortage to be 10.3% and 12.9% respectively. It shows that there is power shortage which is a great hindrance to use of computers and digital libraries.

6. **Reading Habits:** Reading printed books is pleasure as depending on convenience every user use the printed books, journals, etc and any time without any medium (like computer), the users can use the documents. In case of digital libraries, the use of paper is restricted and it is not possible for general user

to read the books through electronic media directly. Even though, many of the thinkers have propounded the theory of paperless society, still paper is essentially needed for the users of libraries to get prints from e-documents for their use. On the other side, digital libraries are most advantageous for easy searching, browsing and just for reference. Hence, digital libraries to a greater extent are of no use especially in academic environment.[5]

CONCLUSION:

Due to the ICT revolution and based on the nature of users and their information requirements, the academic libraries extend their services through ICT tools and applications. From the above discussion, it is clear that the digital libraries are not for the masses and are for only few. The computer and internet experts mostly living in urban areas are benefitted from the digital libraries rather than all the users. Few portion of the total population in India is illiterates and a great majority of the population is computer illiterates. Hence, digital libraries are of no use for masses. In academic environment, the university libraries may get the benefits from digital libraries. It is suggested to librarians, information scientists, teachers, etc to study the interests of the users and nature of the libraries along with the infrastructure that is available to their institutions and users. Based on these interests, they have to decide on the nature of libraries. The digital libraries are against the principle 'information for all' and are creating 'information and technology gap' or 'digital divide' in the society.

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