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Digital Libraries: Functionality, Usability, and Accessibility

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Introduction

Rapid advances in information technologies have revolutionized the role of libraries. As a result, libraries face new challenges, competitors, demands, and expectations. Libraries are redesigning services and information products to add value to their services and to satisfy the changing information needs of the user community. Traditional libraries are still handling largely printed materials that are expensive and bulky. Information seekers are no longer satisfied with only printed materials. They want to supplement the printed information with more dynamic electronic resources. Demands for digital information are increasing.

Digital libraries will start gaining ground in India in the present century. We are heading toward an environment in which digital information may substitute for much print-based information. A library's existence does not depend on the physical form of documents. Its mission is to link the past and the present, and help shape the future by preserving the records of human culture, as well as integrating emerging information technologies. This mission is unlikely to change in the near future.

Digital libraries come in many forms. They attempt to provide instant access to digitized information and consist of a variety of information, including multimedia.

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. Bush (1945) created a vision based on experience ("Digital library.")

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. (Shiri 2003)

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. ("Digital Library")

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.

Lynch (1994) says that, “digital Libraries ... [provide] users with coherent access to a very large, organized repository of information and knowledge.” According to Berkeley Digital Library Project, University of California, the digital library will be a collection of distributed information sources. 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.

Characteristics of Digital Libraries

Recent developments in library technology and practices have helped bring some of Lancaster's paperless society to reality. The effects that digital technology has brought include: (Jebaraj and Deivasigimani 2003)

Digital library collections contain permanent documents. The digital environment will enable quick handling and/or ephemeral information. Digital libraries are based on digital technologies. The assumption that digital libraries will contain only digital materials may be wrong. Digital libraries are often used by individuals working alone. The physical boundaries of data have been eliminated. Support for communications and collaboration is as important as information-seeking.

Compression of data storage is enabling publication and storage of digital information. Telecommunications is facilitating the storage, retrieval, use, and exchange of digital resources.

Function of Digital Library

- Access to large amounts of information to users wherever they are and whenever they need it.
- Access to primary information sources.
- Support multimedia content along with text
- Network accessibility on Intranet and Internet
- User-friendly interface
- Hypertext links for navigation
- Client-server architecture

- Advanced search and retrieval.
- Integration with other digital libraries.

Purpose of Digital Library

- Expedite the systematic development of procedures to collect, store, and organize, information in digital form.
- Promote efficient delivery of information economically to all users.
- Encourage co-operative efforts in research resource, computing, and communication networks.
- Strengthen communication and collaboration between and among educational institutions.
- Take leadership role in the generation and dissemination of knowledge

Components

The components of a digital library are:

- Infrastructure
- Digital Collection
- Systems function
- Telecommunication facility
- Human resources

Planning for Digital Library

A digital library committee should be formed to plan for its creation and maintenance. The members must be from various library departments, and, if necessary, consultants can be hired. There are at least two ways of developing a digital library: converting a traditional library into a digital library, and direct development of a digital library.

Planning includes:

- IT Infrastructure
- Digitization
- Access
- Staffing
- Furniture, equipment, and space
- Services
- Funding

Creation of Digital Resources

- Database of digital material that is open to all users over the campus-wide LAN.
- High bandwidth Internet connectivity
- Focus selectively on acquiring digital resources
- Electronic journals, and gradual elimination of print subscriptions
- Licensed databases
- Creation of local digital content available within the university

Advantages of a Digital Library

The advantages of digital libraries include

- Nearly unlimited storage space at a much lower cost
- Re-allocate funds from some staff, collection maintenance, and additional books.
- No physical boundary
- Round the clock availability
- Multiple access
- Enhanced information retrieval.
- Preservation for some print material
- Added value
- Universal accessibility

Limitations

- Lack of screening or validation
- Lack of preservation of a fixed copy (for the record and for duplicating scientific research)
- Lack of preservation of “best in class”
- Difficulty in knowing and locating everything that is available, and differentiating valuable from useless information.
- Job loss for traditional publishers and librarians
- Costs are spread and many become hidden.

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, Gol (<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, Kharagpur (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 GoI. While one government agency is providing support for one particular aspect, the other is focusing elsewhere, without any coordinated effort by a nodal agency.

Conclusion

There will be continuing expansion of digital library activities. LIS and computer science professionals face challenges that will lead to improved systems. More and more libraries will have departments and programs in the digital library arena. Digital libraries will build upon work being done in the information and data management area. Digital libraries provide an effective means to distribute learning resources to students and other users. Planning a digital library requires thoughtful analysis of the organization and its users, and an acknowledgement of the cost and the need for infrastructure and ongoing maintenance (Adams, Jansen, and Smith 1999). Digital Libraries present opportunities and challenges for the library and information communities and all stakeholders.

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