Digital Development and Challenges of Digital Libraries in India

By

G.Shantha

Librarian, Arulmigu Palaniandavar Arts College for Women, Palani

Abstract

Over recent years, libraries have grown increasingly reliant on digital materials. Libraries are encountering for new resources, which are "Born digital" and have no print or analogue equivalent - they exist only in digital form. The introduction of digital technologies into the processes of production, distribution & storage of information challenges the capacity and ability of libraries & other cultural institutions to carry out their responsibility for preservation. As universities, regional research centers, laboratories, corporations, and professional societies develop their own depositories of information and make them available to the world's networks, they take on the publisher's and the library's traditional roles. Digital surrogates can assist in deflecting demand away from handling Originals (provided high-quality images are readily available), not only for detailed analysis of the items but also for browsing.

Keywords: Digital Library, Regional Library, University Library.

1. Introduction

Over recent years, libraries have grown increasingly reliant on digital materials. Libraries are encountering for new resources, which are "Born digital" and have no print or analogue equivalent - they exist only in digital form. The introduction of digital technologies into the processes of production, distribution & storage of information challenges the capacity and ability of libraries & other cultural institutions to carry out their responsibility for preservation. The purpose of preservation is to ensure protection of information of enduring value for access by present and future generations. Libraries, traditionally have assumed the responsibility for preserving information, face technical, Organizational resource, and legal challenges in responding to the new demands for digital preservation. Digitization is a major issue for preservation managers in libraries. Digital surrogates can assist in deflecting demand away from handling Originals (provided high-quality images are readily available), not only for detailed analysis of the items but also for browsing. Still many librarians from western countries are of the opinion that digitization should not be allowed to detract from traditional conservation efforts to preserve the original.

In the digital library environment, the traditional roles of publishers as information packagers and information distribution facilitators and the traditional role of libraries as storehouses of information will be deemphasized. As universities, regional research centers, laboratories, corporations, and professional societies develop their own depositories of information and make them available to the world's networks, they take on the publisher's and the library's traditional roles. These entities, in this function, have the potential of diminishing the role of traditional libraries and commercial publishers if (i)Faculty tenure guidelines more solidly support publications through these entities in electronic format, returning intellectual ownership of research output to their faculty members; (ii)University and scholarly Presses become activists in the electronic publishing revolution; (iii)Everything possible is done to support fairly-prices democratic access to information while supporting intellectual copyright;

and most importantly, (iv)Information access and delivery systems are designed to meet the consumers' needs. To meet the consumers' needs, digital library systems must be dependable; must be reasonably priced; must have powerful, easy-to-use, intelligent search engines; must have attractive user interfaces; must allow the consumer to inspect the "product" before buying; and must allow access from, and delivery to, the consumer's workstation. Editors, faculty, and librarians will have important roles as organizers, and reviewers, guardians of intellectual property in the digital libraries of the future. Copyright is a major issue for the digital library and will be until new copyright law adequately addresses various information formats. Librarians will take part in the formation of new copyright law and in the application of the law in the digital library.

2. Need for Digital Libraries

Determine the appropriate purpose of our program based on the needs of our library and audience.

- Become more aware of the issues, needs and concerns of people with disabilities in accessing electronic resources.
- Develop library services accessible to a wide range of users by applying universal design principles.
- Understand the primary types of adaptive technology and their implications for people with disabilities.
- Plan and implement adaptive technology capabilities for library computer workstations.
- Learn universal design principles for developing World Wide Web and other electronic resources.

Libraries play an important role in ensuring equitable access to information for all members of our society. Digital Libraries provide accommodations for people with disabilities so that they can utilize the same services and resources as other people.

- Making Library Resources Accessible to People with Disabilities.
- Working Together. People with Disabilities and Computer Technology.
- Meet the Speakers in the Videotape: Working Together: People with Disabilities and Computer Technology.
- World Wide Access: Accessible Web Design.
- Meet the Speakers in the Videotape: World Wide Access

3. Indian Digital Resources

Historically libraries have been committed to providing equal access to information to their constituents, whether they are the general public, the students and faculty of a college, or the employees of a business. The rapid development of electronic information resources has changed the physical and service features of our libraries. Throughout this change, many libraries have embraced a goal of making their resources easier to access. The development of sophisticated multimedia electronic and World Wide Web resources are seen as methods of extending the reach of the library. Increasingly, however, these resources are not fully accessible to people with some types of disabilities. As more information is delivered using computer and network technologies, libraries play an increasingly important role in ensuring access for all people to Internet and electronic information resources. In making libraries and electronic resources accessible, principles of universal design should be employed. Access to

computing resources for people with disabilities in your library involves two issues: (i) Access to the computers themselves and (ii) Access to the electronic resources. Electronic resources include operational programs such as word processors and spreadsheets and information resources such as encyclopedias and databases available through local and networked computer systems.

4. Digitilization of Indian Libraries

Digitalization refers to the process of translating a piece of information such as book, sound recording, picture or video into bits. Bits are the fundamental units of information in a computer system. Turning information into these binary digits is called digitalization. To build a "Digital Library" requires that the content of a collection be available electronically. The rhetoric of the information highway has provided the impetus to convert many existing paper-based (or sound, video) collection into new digital media. The assumptions that digital collections will be more accessible to a broader range of users, presumably through networking techniques and new efficiencies are to be gained in resource sharing and for preservation. Digitalization requires a basic process, which involves different sets of hardware and software technologies at each step. Determining the appropriate technology is directly linked to the anticipated use and purpose of the material being digitalized. For digitizing the text and other material, following four methods can be used. (i) Manual data entry Scanning (ii) Optical Character recognition (OCR) (iii) Excalibur Technologies and pattern recognition technologies (iv) Document Imaging. Rapid developments are taking place in both the hardware and software involved in digitization. This means that the present technology will soon be supplemented by newer technology.

4.1 Requirements
The Components of digital library are:

- Local library system with adequate PC's having LAN Connection.
- Local databases, CD-ROM, Servers, Provision of E-mail.
- Networks including networks of networks
- A variety of systems functions to co-ordinate manage the entry to retrieve data.
- Well trained manpower

4.2 Functions
The Functions of digital library are:

- To manage large amount of digital contents (eg.) Images, Audio Clips.
- To manage contents from multiple locations.
- To enable greater access to information.
- To enable one to perform searches that is not practical manually.
- To preserve unique collections to digitalization.
- To provide means to enrich the teaching and training environment.
- To protect content owners of information

4.3 Data Storage and Management
Data Storage and Management Server machines store & retrieve data, RDBMS (Relational Database Management system like SYBASE, Oracle and DBS) are being used popularly for organizing and managing the digital data. Server machine has to retrieve data from various resources, networks to the users irrespective of time and geographic location. Client machine controls by users stored in the server. It also maintains indexing information.

It includes organization and filtering tools. It is the different forms of data. The role of client machine and the server can be played a single computer for small collection. The query is routed in the client. Non technical factors affecting right management such as laws, legislation, regulations and licenses are developed to data improper access and use of information & to product intellectual property rights. Technology has developed some methods for right management. IBM has developed visible and hidden marking techniques that enables designation and ownership of digital content and data misuse variable watermarks utilizing a pa ten ted process called Variable Random Brightness Alteration (VRB14) Least significant Bit Coding (BC) techniques is implemented by hiding data by adjusting one of the light bits representing a byte of information of an image. The unlicensed user can only see the image and does not have access to the information encoded with the image. "Trusted system" technology is being developed by a group of companies namely IBM.

4.4 Digital Publication and Distribution

Digital Publication and Distribution is an important demand of digital library solution is "network computing". Most of the digital libraries use Internet for electronic publication & Distribution. It promises universal and unified access for information. Electronic environment enables editors to send the manuscripts of scholarly articles to reviewers & to receive responses more quickly and to publish the journal expeditiously. In electronic form the type setting cost of a paper is low compare to other forms. Publication of University Journal can be done by mounting it on the network as soon it clears the editorial review. The subscribers elsewhere can retrieve them from network. The advantages of Digital Libraries are:

- Information is always available and not limited by physical location.
- Electronic documents can be many.
- Quick, accurate and easy to locate information.
- Acquisition, cataloguing or indexing facilitated easily

The limitations of Digital Libraries are:

- Information in digital library can be accessed only through computer.
- Digital library demand dust free centrally air conditioned atmosphere for perfect performance
- Digital data is too unstable.
- The durability of a single CD-ROM is for only 25 years.
- A lot of time is consumed in the retrieval process
- Lack of global organization

4.5 Digital Resources of Information

The resources of information which are available in the form of Digital or Electronic format are known as digital resources. Digital resource is the knowledge that becomes a dynamic resource for global sharing more easily than knowledge in any form and lends scope for automated delivery mechanisms. Information has been embedded in varieties of ways and forms in various kinds of digital resources. Following are some of the digital resources of information by which we can retrieve the required information within reasonable time with speed and accuracy:

- OPAC (On-line Public Access Catalogue).
- Electronic Texts and Journals.
- CD-ROMS.
- Computer Networks like LAN and WAN.

- Multimedia.
- Internet.
- E-mail and Bulletin Board.
- Audio-visual aids.

4.6 Managing Digital Resources in India

In Libraries, to create and manage digital resources, first of all libraries must be automated by computer applications. The basic requirements for creating digital resources are,

- All the functions of the Library should be computerized.
- Networking facilities like LAN and WAN must be available in the Library
- CD-ROM and Multimedia Workstations to be installed.
- Internet connection must be provided.
- Digital computer Scanner and CD Writer facilities to be established.

5. Results and Discussions

The digital library concept is diffused with different people meaning different things, such as digital repositories, digital archives, Institutional repositories, Electronic Thesis and dissertation, digital consortia etc. For the present study 50 digital libraries with institutional repositories are identified for the study. The selection of digital libraries is based on digitization activity using OCR software for conversion of analog data into digital form. The selection of Institutional repositories based on the use of open sources digital library software for preserving and archiving digital information. The study investigated the development of digital libraries and in India and issues and challenges faced in design and development of digital libraries. The rationale for developing digital collections may vary from library to library. The purpose of digitization may vary depending on institutional objectives.

Table-1: *Period of Origin of Digital Libraries*

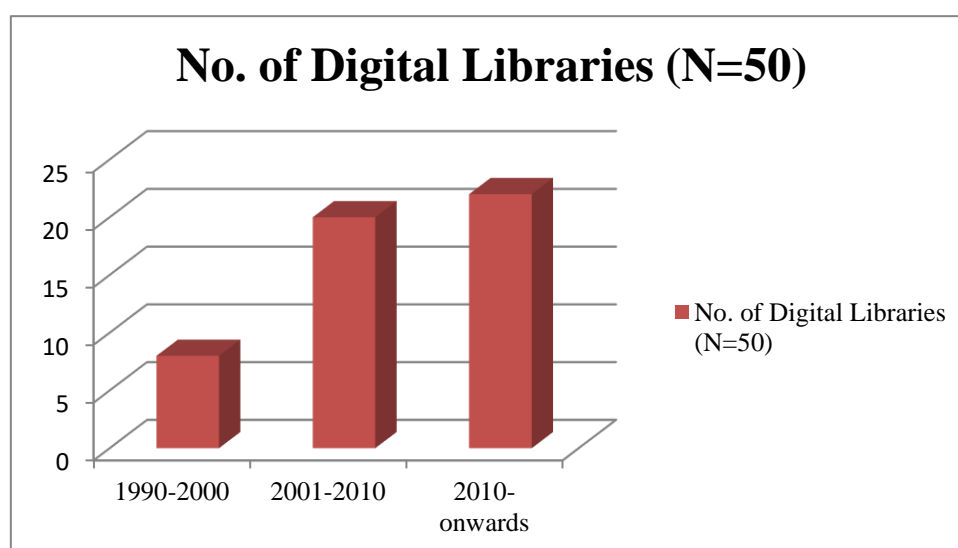| Period of Origin of Digital Libraries	No. of Digital Libraries (N=50)	Percentage (%)
1990-2000	8	16
2001-2010	20	40
2010- onwards	22	44

Figure-1: *Period of Origin of Digital Libraries*

Table-1 highlights reasons for digitization by digital libraries. It is observed that for different reasons the institutions are initiating the digitization activities. Preservation of content is the main reason for digitization has been stated for highest percent (97) of digital libraries. (84) percent of digital libraries have also started digitization projects with an intension to provide access to the web version of the content to wider audience. Development of Teaching tools and dissemination of digital collection are reasons for the digitization has been stated by (40 – 44) percent of digital libraries.

The paper also present assessed the quantity of library materials converted into digital form each year so that they can be accessed by wide range of population with in limited time, money and skilled professionals. The percentage of conversion of library materials into digital content each year is shown in Table-2.

Table-2: *Quantity of Library Material Digitized every year*

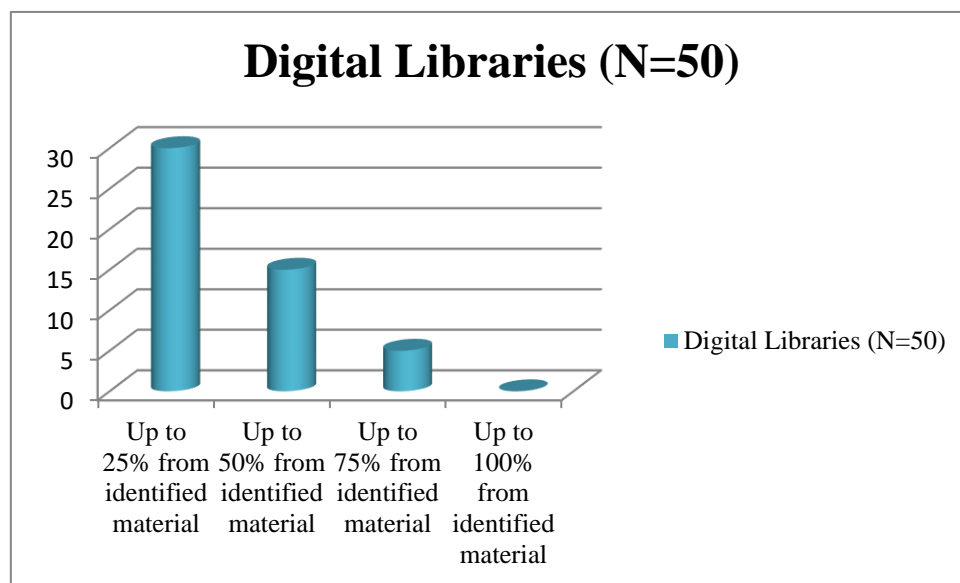| Quantity Digitized every year	Digital Libraries (N=50)	Percentage (%)
Up to 25% from identified material	30	60
Up to 50% from identified material	15	30
Up to 75% from identified material	5	10
Up to 100% from identified material	0	-

Figure-2: *Quantity of Library Material Digitized every year*

It is seen from the Table-2 and Figure-2 that nearly 60 percent of the libraries surveyed are converting less than 25 percent of the identified materials into digital form each year. About 30 percent convert less than 50% their material each year. About 10 percent convert less than 75% their material each year. None of the libraries have converted all the materials selected into digital form.

6. Conclusion

The study undertaken a descriptive survey of digital libraries located in different parts of India, focusing on their origin, development and management. The main purpose of the study was to explore the status of digital library initiatives in India and find out the issues and challenges encountered by them. The study look into the set of opportunities as well as merits

of creating digital libraries and services offered to the users. It is observed that for different reasons the institutions are initiating the digitization activities. Preservation of content is the main reason for digitization for highest percent of digital libraries surveyed. Digital libraries have also started digitization projects with an intension to provide access to the web version of the content to wider audience. Development of teaching and learning tools and dissemination of digital collection are reasons for initiating digitization in the case of few libraries.

References

[1] Adam, S. (2010). Preserving authenticity in the digital age. Library Hi Tech, 28(4), 595-604.

[2] Ahmad, L. & Fayaz. (2011). Open Access e-book Collection on Central Asia in Selected Digital Archives. Collection Building, 30(3), 126-130.

[3] Arora, J. (2003). Indian National Digital Library in Engineering Science and Technology (INDEST): A Proposal for Strategic Cooperation for Consortia-based Access to Electronic Resources. Intl. Inform. & Libr. Rev,35(1), 1-17.

[4] Bansode, S., & Pujar, S.M. (2008). Scholarly Digital Library Initiatives: World Versus India. DESIDOC Journal of Library & Information Technology, 26(6), 21-26.

[5] Bhattacharya, P. (2004). Advances in Digital Library Initiatives: A Developing Country Perspective. International Information & Library Review,36, 165-175.

[6] Chakravarty, R. (2012). Traditional Knowledge and Innovation Management Strategies in India: Recent Trends. Journal of Knowledge & Communication Management, 2, 1-10.

[7] Chowdhury, S., Landoni, M., & Gibb, F. (2006). Usability and impact of digital libraries: A review. Online Information Review,30(6), 656-680.

[8] Das, A.K., Chaitali, & Sen, B.K. (2007). Information retrieval features in Indian digital libraries: A critical appraisal. Oclc System and Services,23(1), 92-104.

[9] Frank, C.H. (2009). Applied digital library project management: Using paired comparison analysis to determine relative importance. OCLC Systems & Services, 25(3), 162-166.

[10] Gaona-Garcia, 8.P.A., Martin-Moncunill, D., & Montenegro-Marin, C.E. (2017). Trends and challenges of visual search interfaces in digital libraries and repositories. The Electronic Library, 35(1), 69–98.Retrieved from DOI: 10.1108/EL-03-2015-0046.

[11] Hombal, S.G. and Prasad, K.N (2012). Digital Copyright Protection: Issues in the Digital Library Environment. DESIDOC Journal of Library & Information Technology, Vol. 32, No. 3, pp. 233-239.

[12] Jayakanth, Minji, F., Dastidar, F., & Prabir, G. (2012). Setting up an open access digital repository: A case study. Annals of Library and Information Studies, 59, 16-24.

[13] Kapoor, K. (2002). Metadata: A Pathway to Electronic Resources. Annals of Library and Information Studies,49, 7-11.

[14] Lakshmi, R., & Suma, P. (1998). A Step towards developing a digital library. Library Science with a Slant to Documentation and Information Studies, 35(1), 25-36.

[15] Mahapatra, R.K. (2012). Digital Content Creation and Management in Agricultural Libraries in India: Issues and Trends. DESIDOC Journal of Library and Information Science, 32(1), 31-37.

[16] Mandal, A.K., & Roy, U. (2012). An Efficient Approach for E-Content Management and Delivery in Digital Library. World Digital Libraries – An International Journal, 5(1), 1–10.