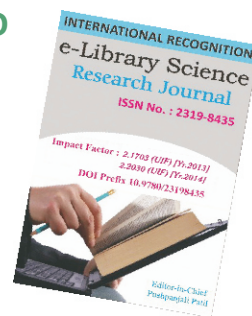# DIGITIZATION OF LIBRARY: SERVICES, CHALLENGES AND PRESERVATION OF DIGITIZED INFORMATION

Tufail Ahmed Abdul Munaf Shaikh

Ph.D Student , North Maharashtra University, Jalgoan.

ABSTRACT

This paper present the development of digital library, challenges, services and the preservation of digitizes information (Digital Information). If information technology pushes, the crashing costs, and global connectivity are the signs for the coming decade, digital library is the next step in the revolution. Digital library is innovations, the implementation of which is nascent in the developing countries. New technologies for knowledge creation and management in the future and also digital technologies present a preservation solution for the document or information in the library with increased to access to digitized document or information over the networks. Digital technologies are update day to day. The purpose of this article is to describe basic concept, process, need and purpose, services of digital library and discuss the challenges of digital preservation problem in the digital scenario.

KEYWORDS :_Digital Libraries, Definitions, Need and Purpose, characteristics, challenges, Services, and Preservation of digital Information._

1.INTRODUCTION :

Historically, libraries have witnessed more technological changes in the past decade and the exponential growth of information in the World Wide Web (www). The developments in computer hardware, software. Developments in Information technology and communication technology (Internet) have revolutionized libraries into "Knowledge Center or Information Center". Information on websites is increasing day by day. To cope with situation digital libraries have emerged with the task of digitalization, storage, access, digital knowledge mining, digital, reference service, electronic information co-ordination and manage the archives and its access, preservation of digital information.

This article present the development or evaluation of digital library and explain various definitions and concept of digital library. It also describes various issues or aspects of digital library challenges, services and preservation of digital library. [1] [2]

2.MEANING AND DEFINITION OF DIGITAL LIBRARY
2.1 Meaning

What is a digital library? There is much confusion surrounding this phrase. The library

community has used several different phrases over the years to denote this concept or meaning of electronic library, virtual library, library without walls and it never was quite clear what each of these different phrases meant. "Digital library" is simply the most current and most widely accepted term and is now used almost exclusively at conferences, online, and in the literature. [3]

The terms digital library, electronic library and virtual library are being used synonymously which is not the exact case. Digital library or electronic library may roughly mean one and the same. Digital library or electronic library may not necessarily be networked, but would largely contain digitized information along with print publications, but the virtual library is library without wall spread across the globe, from where are is able to retrieve the whole world of information through properly networked workstation. The emergence of the internet and the wide availability of affordable computing equipment have created tremendous interest in digital libraries and electronic publishing. [4] [5]

2.2.Definition

First, we need to define what we mean by a "digital library". The term "digital library" appears now to be preferred for a concept which is also described variously as: virtual library, electronic library, library without walls. These terms are essentially used interchangeably. But the concept of the digital library needs more careful definition. In the term "digital library" are two important concepts.

1.Digital, i.e., information in any digitized format
2.Library, i.e., a total mechanism for obtaining access to, storing, organizing and delivering information

A digital library remains a library, with the same purposes, functions and goals as a traditional library. The digital part of the term indicates merely that the material is stored and accessed digitally. A digital library is therefore far more than a digital collection, particularly a collection, as is illustrated in the overwhelming number of the World Wide Web sites on the Internet, which consists of relatively volatile current information.

Definition of "Digital Library (DL)" that makes sense to librarians? As a starting point, we should assume that digital libraries are libraries with the same purposes, functions, and goal as traditional libraries, collection development and management, subject analysis, index creation, provision of access, reference work, and preservation. A narrow focus on digital formats alone hides the extensive behind the scenes work that libraries do to develop and organize collections and to help users find information. [6] [7]

According to Don Waters, "Digital libraries are 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 and economically available for use by a defined community or set of communities." [8]

According to Michael Lesk, "Digital libraries are organized collections of digital information. They combine the structuring and gathering of information, which libraries and archives have always done, with the digital representation that computers have made possible." [9]

According to William and Saffady, "Digital library is a library that maintains all, or substantial part, of its collection in computer processible form as an alternative, supplement, or complement to the conventional printed and microfilm materials that currently dominate library collections." [10]

According to Fox and Goncalves "There is as yet no single, agreed upon definition of digital libraries. The sense in which the term is used refers to text and multimedia formats that are stored in

digital format such as databases, World Wide Web or digital audio and video formats and which appear to the user as a single coherent system."[11]

According to Gladney H.M, et. al. "A digital library service is an assemblage of digital computing, storage, and communications machinery together with the 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."[12]

3.CHARACTERISTICS OF DIGITAL LIBRARY

•Digital libraries are the digital face of traditional libraries that include both digital collections and traditional, fixed media collections. So they encompass both electronic and paper materials.
•Digital libraries will also include digital materials that exist outside the physical and administrative bounds of any one digital library
•Digital libraries will include all the processes and services that are the backbone and nervous system of libraries. However, such traditional processes, though forming the basis digital library work, will have to be revised and enhanced to accommodate the differences between new digital media and traditional fixed media.
•Digital libraries ideally provide a coherent view of all of the information contained within a library, no matter its form or format
•Digital libraries will serve particular communities or constituencies, as traditional libraries do now, though those communities may be widely dispersed throughout the network.
•Digital libraries will require both the skills of librarians and well as those of computer scientists to be viable. [13] [14]

4.NEED AND PURPOSE OF DIGITAL LIBRARY

Digital libraries aim at unhindered access to content over computer and communication networks, which justify the need for resorting to such a setup for useful information resources. Digitization may also be taken as a visible proposition to enhance their life by preservation apart from the virtue of increased and easy access, thereby furthering usage. In the digital form, since users can make any number of copies and only these copies of the material are being used at one point of time, fair chances exist for at least one electronic copy to be available on the network for use by posterity. Many printed materials do not have any index, and indeed when available they are visibly archaic. These materials in digital form laced with functional and exhaustive search engines will go a long way in effective access andefficient bibliographic control of the country's output.

The aspects of everlasting preservation and enhanced access must be ensured vigorously now by the applications of new technology for digitizing and electronic access of invaluable content. Advancements in computer and information technology with breakthroughs in memory technology have not only reduced the cost of infrastructure required for hosting digital libraries, but the demonstrated success of a wide variety of projects in the USA and Europe also endorsed the chances of their survival even in a developing country. Since digitization and digital library development are stupendous tasks involving computer and communications infrastructure, and considerable specialized human skill, a digital storage and selective search and access facility can be set up by formulating a collaboration of few institutions active in computerized information handling. [15]

5.DIGITAL LIBRARY SERVICES

Digital Library Services provides a wide array of services to assist members of thelibrary with

organizing collections of materials or making them more widelyavailable. The following services offered by the Digital Libraries.

- Catalogue Databases,
- Current Awareness Bulletins,
- Externally Purchased Databases,
- CD-ROM Databases
- Remote Information Services,
- Internally Published Newsletters, Reports & Journals
- Internet Information Sources Mirroring & Cataloguing,
- E-mail,
- Bulletin Board Service,
- Netnews system,
- Audio and Video Communication,
- Electronic Table of Contents,
- Electronic Document Delivery Service,
- Electronic Theses and Dissertations,
- Reference Service,
- Electronic Publishing,
- Discussion groups and forums
- Central storage facilities for Hosting digital collections and indexes
- Tools for loading, storing, searching, and displaying digital objects
- Special Collections service[16]

6. DIGITAL LIBRARY CHALLENGES

For many, the term digital library conjures up an image of a sprawling universe of information available through the Internet and accessible via home or office workstations, fulfilling the promise to provide information at any time, to any place, and for any user.

Many consider the World Wide Web to be "the" digital library. This vast information conglomeration is too volatile to be called a storehouse, however; but thinking of digital libraries merely as vast repositories of materials is also too limited. To be genuinely useful, a digital library must have a number of characteristics, enumerated below, in addition to being a collection of digitized materials.

6.1 Coherence

Digital libraries should have a coherent, organizing principle, sorting materials by topic or by type of material, for instance. Subject experts in each area can assemble the collections, which will then be combined to form large digital libraries maintained by institutions for their clientele and the global Internet community. Ideally, different institutions will take responsibility for building digital collections of various types and then share those collections with others, thus optimizing the advantages of the distributed nature of the Internet.

6.2 Economic Infrastructure

Although currently, many Internet sites are open, free of charge, an increasing number of sites are limiting access to subscribers or to those who pay a fee. Some digital library projects that have been

developed in academic institutions now are searching for continued funding and are considering licensing arrangements or user fees.Electronic commerce in the digital environment is still in the early stages of development.

6.3 Search ability

The ability to find and use materials on the Internet is a major challenge for most users. While rudimentary tools are available, they often yield disappointing results. Many researchers and companies are working on accessibility issues from several vantage points. Developing more sophisticated search engines is one approach; another is developing filtering devices based on individual profiles and "know bots" that search the Internet on the user's behalf. In addition, researchers and practitioners are looking at the information that needs to be imbedded or attached to networked information in order for the search systems to be most effective. If a document or Web site has information about itself built into it in a standard format (metadata), that will allow the search engines to retrieve information more efficiently.

6.4 Preservation

By definition, libraries collect information for both current and future needs of users. However, there are few systematic efforts in place to ensure continued access to the digital collections on the Internet. Information on the Internet is, in many cases, ephemeral and presents considerable challenges for archiving. Preservation must also ensure that information resources remain intact; unauthorized tampering with the content of electronic resources could have grave implications for its continued value. Security technologists will aid in preservation by preventing corruption or destruction of information resources and ensuring their authenticity.

6.5 Service

Many Internet users operate in a self-service mode, but not necessarily out of choice. Few digital libraries have built services into their offerings of collections. Users of a data set from the Bureau of the Census might need assistance with interpretation or manipulation of the information or a user might need assistance with the best way to use existing Internet search engines. Digital libraries can build in services where users can ask questions (see the Internet Public Library at http://ipl.sils.umich.edu/), use frames to provide guidance and instruction, and can develop FAQ (frequently asked questions) files to assist users.

6.6 Opportunities

Digital libraries offer new opportunities to enhance the value of collections to users. The Library of Congress's National Digital Library Program's "American Memory" project includes a "Learning Page" that helps K-12 teachers and students to use materials related to the topics of their collection (see http://lcweb2.loc.gov/ammem/). The digital library, GALEN II, being developed at the University of California, San Francisco, plans to provide its users with the tools they need to create, disseminate, and organize information as well as just find it (see http://www.library.ucsf.edu). Digital libraries are offering a wealth of information to a large community of users and will become an increasingly valuable part of the Internet as they are developed in a coherent and imaginative way. [17]

7.DIGITAL PRESERVATION

Digital preservation is an increasingly important subject of research, development and

discussion. There is a general perception that the preservation of digital information is more problematic than preservation of print or other formats. This is increasingly a cause for concern as the proportion of information being made available only in digital form increases, because there is no hardcopy version that can be preserved.

The problems surrounding the preservation of digital information include technological obsolescence. As formats, software, hardware, and storage media become obsolete, there is a risk that information becomes inaccessible and unusable. This is not the only problem. There are many others, including the ephemeral nature of much digital information. Information may change or disappear before it can be captured and preserved. Information is disseminated in new ways and business models are also changing. Increasingly, information is not purchased but 'rented' through licensed access rather than physical ownership of an information artifact. Libraries are increasingly losing physical control over their digital collections.

To preserve digital information, digital libraries will continually have to "migrate" information from one digital hardware and software configuration to another. The Report of the Task Force on Archiving of Digital Information suggests that "rapid changes in the means of recording information, in the formats for storage, and in the technologies for use threaten to render the life of information in the digital age as, to borrow a phrase from Hobbes, 'nasty, brutish and short.'" The digital preservation function must be attended to in all digital collections. Even libraries which do not normally have a significant preservation concern will find that digital collections will require "refreshing" and migration to new systems to maintain their accessibility. Technological obsolescence, migration of digital information, legal and organizational issues all test the "limits of digital technology." There are no preservation standards for digital information. [18] [19] [20]

8. DEFINITION OF DIGITAL PRESERVATION
8.1 Short Definition
Digital preservation combines policies, strategies and actions that ensure access to digital content over time.

8.2 Medium Definition
Digital preservation combines policies, strategies and actions to ensure access to reformatted and born digital content regardless of the challenges of media failure and technological change. The goal of digital preservation is the accurate rendering of authenticated content over time.

8.3 Long Definition
Digital preservation combines policies, strategies and actions to ensure the accurate rendering of authenticated content over time, regardless of the challenges of media failure and technological change. Digital preservation applies to both born digital and reformatted content.

Digital preservation policies document an organization's commitment to preserve digital content for future use; specify file formats to be preserved and the level of preservation to be provided; and ensure compliance with standards and best practices for responsible stewardship of digital information. [21]

9.NEED FOR DIGITAL PRESERVATION
In order to preserve digital materials on a scale commensurate with mass storage capabilities andin formats that are accessible and usable, it is necessary to articulate some basic

requirements.These are:

9.1 Users' perspective
User's expectation is always changing, yet users, especiallyresearch scholars need both traditional documents and electronic documents orold information and current information.

9.2 Institution's responsibility
Libraries, archives and other custodians haveresponsibility for their any properties. So institution should plan for digitalmaterials including their maintenance, preservation, and distribution.

9.3 Missions of parent institution
First object of libraries, archives and othercustodians is to satisfy the user's expectation and user's requirements. Theyshould preserve all materials in all formats.

9.4 Storage media
Storage media is having different formats such as text, data,graphics, video, and sound, different storage capacity like floppy disk, CD-ROM,VCD, etc. and different durability 2years, 5 years or 10 years. Handling system ofdigital materials also is different kinds.It is to be noted that Digital storage is not for only print documents, it is also arequirement for oral, cultural and those information are out of print. [22]

10.TYPES OF DIGITAL PRESERVATION
Considering digital materials, there are threetypes of "preservation" one can refer to:

10.1 The Preservation of the Storage Medium
Tapes, hard drives, and floppy discs have a veryshort life span when considered in terms ofobsolescence. The data on them can berefreshed, keeping the bits valid, but refreshingis only effective as long as the media are stillcurrent. The media used to store digitalmaterials become obsolete in anywhere from twoto five years before they are replaced by bettertechnology. Over the long term, materialsstored on older media could be lost becausethere will no longer have the hardware orsoftware to read them. Thus, libraries will haveto keep moving digital information from storagemedium to storage medium.

10.2 The Preservation of Access to Content.
Thisform of preservation involves preserving accessto the content of documents, regardless of theirformat. While files can be moved from onephysical storage medium to another, whathappens when the formats (e.g., Adobe AcrobatPDF) containing the information becomeobsolete? This is a problem perhaps bigger thanthat of obsolete storage technologies. Onesolution is to do data migration¾ that is,translate data from one format to anotherpreserving the ability of users to retrieve anddisplay the information content. However, thereare difficulties here too— data migration iscostly, there are as yet no standards for datamigration, and distortion or information loss isinevitably introduced every time data ismigrated from format to format.

The bottom line is that no one really knows howyet how to best migrate digital information.Preserving digital information: The Report ofthe Task Force on Archiving of DigitalInformation (RLG, 1995) by the USCommission on Preservation and Access andRLG states, "The

preservation community is onlybeginning to address migration of complexdigital objects" and such migration remains"largely experimental." Even if there wereadequate technology available today,information will have to be migrated fromformat to format over many generations, passinga huge and costly responsibility to those whocome after.

10.3 The Preservation of Fixed-media Materialsthrough digital technology

This slant on theissue involves the use of digital technology as areplacement for current preservation media,such as microforms. Again, there are, as yet, nocommon standards for the use of digital mediaas a preservation medium and it is unclearwhether digital media are as yet up to the task oflong-term preservation. [23][24][25]

REFERENCES:

1.Moly, T.M. (2007). Digital Information Services: A Boon for the Present and Future Generation, Bangalore, DRTC, p.1 [URL: http://drtc.isibang.ac.in/handle/1849/379 access on 19/07/2010]

2.Rao M. Koteswara (2004). Digital Libraries: Challenges. Opportunities & Implications, Madras: SIS-2004 Conference, 22-23rd January. P.1[URL: https://drtc.isibang.ac.in/handle/1849/174 access on 19/07/2010]

3.Nurnberg, P.J., Furuta, R., (1995). Digital libraries: issues and architectures,pp. 147-153 In Proceedings of the Second Annual Conference on the Theory and Practice of Digital Libraries, Digital Libraries 1995, Austin, Texas, June 11-13, organized by Center for the Study of Digital Libraries, Texas A&M University

4.Fox E.A. & Others (1995). Digital Libraries: Introduction, Communication of ACM, 38(4), pp. 22-28

5.Arms Y William (2001). Digital Libraries. USA, Massachusetts Institute of Technology (MIT Press), pp. 1-2

6.Wainwright Eric B (1996). Digital Libraries: Some Implications for Government and Education from the Australian Development Experience[URL:

http://www.nla.gov.au/nla/staffpaper/ew6.html#container access on 01/08/2010]

7.Cleveland Gary (1998). Digital Libraries: Definitions, Issues and Challenges, Universal Dataflow and Telecommunications Core Programme Occasional Paper, International Federation of Library Associations and Institutions (IFLA), 08,March, p.2 [URL:http://www.ifla.org/udt/op/ access on 25/07/2010]

8.Schwartz Candy (2000). Digital Libraries: An Overview, The Journal of Academic Librarianship, 26 (6), p. 385

9.Digital Library Federation (DLF), (1998). "A Working Definition of Digital Library" [URL:http://www.diglib.org/about/dldefinition.htm access on 19/07/2010]

10.William B.K. and Saffady S. (1995). "Digital library concepts and technologies for the management of collections: an analysis of methods and costs". Library Technology Reports, Vol-31, p.221.

11.Hannah Francis (2008). Digital Libraries: Opportunities and Challenges for English Speaking Caribbean. Information Development, 24(2), p. 143

[URL:http://idv.sagepub.com/content/24/2/143.abstract access on 26/07/2010]

12.Gladney Henry M, Fox Edward A. (1994). Digital library: gross structure and requirements: report from a workshop.IBM Research Report. Submitted to California, USA: IEEE Computer Society Press, Proc. Workshop on On-line Access to Digital Libraries. RJ 9840

[URL:http://www.csdl.tamu.edu/DL94/paper/fox.htmlaccess on 28/07/2010]

13.Cleveland Gary (1998). Op. Cit. pp. 2-3

14.Muqeem Shaista (2007). Changing Role of Library Professionals in the Digital Environment. International Conference on Semantic Web and Digital Libraries (ISDL) [URL:https://drtc.isibang.ac.in/bitstream/handle/1849/400/p92_shaista_khan.pdf?sequence=1acce ss on 28/07/2010]

15.Jeevan V.K.J. (2004). Digital Library Development: identifying sources of content for developing countries with special reference to India. The International Information & Library Review, 36(3), p.187

16.SonkerSharad Kumar and Mahawar K.L. (2007). Digital Library: Processes, Services, Challenges and Opportunities. International Conference on Semantic Web and Digital Libraries (ICSD) [URL:https://drtc.isibang.ac.in/bitstream/handle/1849/390/p78_sharad-sonker.pdf?sequence=1 access on 01/08/2010]

17.Lippincott Joan K.(1997). Challenges of the Digital Library. Educom Review, 32(3) [URL:http://net.educause.edu/apps/er/review/reviewArticles/32356.html access on 01/08/2010]

18.Beagrie Neil and Jones Maggie (2001). Preservation Management of Digital Materials: A Handbook. London: The British Library for Resources the Council for Museums, Achieve and Libraries, pp. 24-25

19.Muir Adrienne (2004). Digital Preservation: Awareness, responsibility and rights issue. Journal of Information Science. 30(01), pp.73-74

20.Kuny Terry and Cleveland Gary. The Digital Library: Myths and Challenges. [URL :http://archive.ifla.org/IV/ifla62/62-kuny.pdf access on 02/08/2010]

21.Definitions of Digital Preservation.Prepared by the ALCTS Preservation and Reformatting Section, Working Group on Defining Digital Preservation ALA Annual Conference, Washington, D.C., June 24, 2007 [URL: http://www.ala.org/ala/mgrps/divs/alcts/resources/preserv/defdigpres0408.cfm access on 02/08/2010]

22.Das Jaba (2003). Digital Information Preservation, Workshop on Digital Libraries: Theory and Practice, Bangalore: DRTC [URL:https://drtc.isibang.ac.in/bitstream/handle/1849/75/J_preservation.pdf?sequence=2access on 03/08/2010]

23.Joseph JVM. andSoundararajan E.. Preservation of Digital Information [URL: http://library.igcar.gov.in/readit-2005/conpro/lgn/s5-1.pdf access on 02/08/2010]

24.Chen Su-Shing (2001). The Paradox of Digital Preservation. Computer 34(03). Pp.24-25

25.Chepesuik R. (1997). The Future is here: American's Libraries go digital. American Libraries, 2(1), pp. 47-49