Digital Library and its Services in the Modern IT Era

Swapan Kumar Bera
Llibrarian
Baruipur College
Kolkata, WB
Cell No. 08013087808
Email- beraswapan@gmail.com
beraswapan@yahoo.co.in

Abstract - *Libraries have undergone major structural change with the advancement of information technology.A digital library that deals with data those are born digital as well as those that have been digitized from their analogue form. Digital libraries have so many advantages over printed documents. For this skilled manpower and equipped infrastructure is needed. The aim of this paper is to discuss significance of digital libraries in the modern information era. It depicts basic concepts, historical background, attribute, process, software, need, advantages,various types of reference services in digital environment.*

Keywords: digital library, digital library software, digital reference services, etc

Introduction:

The present age is the age of information technology. To cope up with the advanced information technology environment, every field is suppose to accept fact and implement new emerging technology in it. So digital library is emerged in the case of library. The concept of digital library is based on storing information electronically and made accessible to users through electronic systems. Digital information may include a combination of structured/unstructured text/numeric data, scanned images, graphics, audio, video, recording etc. Digital library is a common place where any user, researcher, educator can have access to their required information at their workplace itself.

Definitions of Digital Library:

Lesk defines '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".

According to William, B, K and Saffady, S (1995) "Digital library is a library that maintain all or a substantial part, of its collection in computer processible forms as an alternative supplement, or complement to the conventional pointed and microfilm materials that currently dominate library collection".

According to Arms, William Y (1995) "An informal definition of a digital library is a managed collection of information with associated services, where the information is stored in digital formats and accessible over a network. A crucial part of this definition is that the information is managed. A stream of data sent to earth from a satellite is not a library. The same data when organized systematically, becomes a digital library collection".

According to Lynch, Clifford, "Digital libraries are systems providing users with coherent access to a very large organized repository of information and knowledge."

So, digital library may be defined as the new way of carrying out the function of libraries encompassing new type of information resources, new approach to acquisition new method of storing and preservations, new approaches classify and catalogue intensive use of electronic systems and networks and dramatic shifts in intellectual, organizational and electronic practices. Digital library is an integrated set of services for capturing, cataloguing, storing, searching, protecting and retrieval of information , which provide coherent organization and convenient access to typically large amount of digital information.

3. Historical background:

1928: IBM produced a punched card that became the predominant means of inputting information for several decades.

1930: Eugene Power began using microfilm technology in University Microfilm Inc.

1945: Vannevar Bush wrote the article "As we may think" in Atlantic Monthly. He imagined the 'menex machine which is capable of organizing, storing and displaying papers, books, and other information that would be available at each desktops via microfilm.

1960: The first remotely accessible database came online in the late 1960s.

1970: Mediated online searching appeared.

1974: Ted Nelson invented and named hypertext and hyperspace but was failed to build an optical system.

1978: F.W. Lancaster in his book 'Towards paperless information system' envisaged that revolutions in electronics would pave the way for a paperless society.

1980: The first portable computer and end-user software were introduced. In the mid 1980s, CD-Rom and locally loaded databases appeared.

1990: Tim Bemers- Lees World Wide Web. At the same he proposed HTML which describes the structure of documents.

1993: NCSA introduced the 'Mosaic browser to libraries. The Library of Congress announced plans to create digital library, and NSF along with NASA and DARPA announced plans to support the digital libraries initiative.

Later, many other projects were developed including the University of California at Berkeley digital Library Project, University of Michigan Digital Library project, etc.(Rao, M. Koteswara,2004)

Characteristics/Attributes:

Digital library is the combination of traditional and electronic media collections. So, they encompasses both paper and electronic materials. The characteristics are as follows:

- Digital library includes all the processes and services that are nervous system and backbone libraries.
- It can be accessed from user workplace.
- Digital library support formal and internal learning procedures.
- Digital library provides remote access to rare and expensive materials.
- According to Rajshekhar, T. B. (1998) digital library has the following attributes:
- Provide access to very large information collections.
- Focus on providing access to complete information not merely surrogates or indexes.
- Support multimedia content.
- Network accessible.
- Provide user friendly interface.
- Unique referencing of digital library objects.
- Enable 'links' representation to local/external objects (hypertext)
- Support advanced search and retrieval.

Building Digital Library:

Content Selection:
It is depend on utility, value and rarity of collection. The content may be news, reports, software, courseware, lectures, drawing, etc.

Content Acquisition:
Digital library acquired contents already in digital form as well as to be converted. The format should be PDF, TIFF, HTML, XMl.

Content Organization:
The content organization needs special attention in digital library because it is the base of the digital library services and products.

Content Access and Delivery:
Access and delivery area of digital library are developing new innovative technologies and processes in this areas that will capitalize upon the digitized status of digital library content, and allow quicker, easier and cheaper access to content, which in turn will be a powerful justification for digitization effort. Access and delivery process are aided by conversion to digital mass storage.

Access Management:

It contains different types of operations like, access control, content security, object identification, license metering, user ID and password management, IP authentication management, etc. these operations have been controlled by softwares.

Usage and Monitory:

Digital libraries have integrated usage and monitory system that gives answers of such questions like what digital sources are being used, how much and by whom. The answers will be helpful for evaluating the system performances.

Networking and Inter –operation:

Networking enhances digital information services and resource sharing. Inter-operation allows to digital library users to find out desired information from different system across the world.

Preservation:

Digital preservation involves quite different methods, skills, and outcomes and can complement traditional preservation services, while simultaneously providing unique and dynamic new uses of information.

Digital Library Software:

A few digital library software packages are available in the market such as Greenstone, DSpace, E-print, GDL, etc. There are a few library automation software packages which have a separate 'digital library' module. Greenstone and DSpace are famous digital library software in the market.

Greenstone:

Greenstone is a suite of software for building and distributing digital library collections. It provides a new way of organizing information and publishing it on the internet or on CD-ROM. Greenstone is produced by the New Zealand Digital library Project at the University of Waikato and developed and distributed in the cooperation with UNESCO and the Human Information NGO. It is open source multilingual software, issued under the terms of GNU General Public License (http://www.greenstone.org)

DSpace:

Dspace is a groundbreaking digital library system to capture, store, index, preserve, and redistribute the intellectual output of a University's research faculty in digital formats. It is developed jointly by MIT Library and Hewlett Packard (HP). DSpace is now freely available to research institutions world wide as an open source system that can be customized and extended. (http://www.dspace.org)

Need of Digital Library:
There are various factors that explain the need for digital libraries. These are discussed below.

Information Explosion:

This is the era of information expression. Information specially in the field of science and technology is growing rapidly. Most branches of science show an exponential growth of about 4.8% annually, with a doubling period of 10 to 15 years. This high information output required improved techniques in processing and distribution of information. Digital libraries can fulfill all these requirements.

Storage of Information:

Electronic storage of information is the best alternative for solving space problem in libraries. Universities are gradually shifting from investment in the physical presence of information to the creation of electronic access, eg. E-mail, internet, etc.

Specialization of various factors of knowledge:

Many specialized scholars find favourite colleges or their own campus for purpose of complementary work.

Transmission of information:

Now-a-days, students teacher interaction is under crisis as a result of gap between basic teaching and specialized research.

The tools for alternatives could be a video scanner with stored lectures by outstanding scholars. Electronic distance education will become available for wide range of educational instructions, satisfy the needs of motivated students with fulltime jobs.

Advantages:

The advantages of digital library are as follows:
- Access to library electronic services
- Optimizing use of IT environment
- Knowledge content itself will be ubiquitous and in-expensive
- Access to latest information
- Ability to deal with large data sets
- Support wide range of materials
- Faster information retrieval
- No storage problem
- Increase end-users
- Promote knowledge management and content management

- Allow archiving and preserving documents/digital documents on education, cultural, heritage, biodiversity for long terms.
- Generate revenue

Digital Library Services:

Library services are followed by library works. Information technology changes the concept of traditional library work as well as service. Now – days most of the reference books like hand books , encyclopedias, directories , dictionaries etc are published in electronic form. Some secondary resources like abstracting and indexing services are available in electronic form also, for example Index Medicus, Engineering Index, Chemical Abstracts. Digital libraries have been highlighted mainly on providing access to diverse digital information resources. In the changing scenario, reference works of modern libraries are influenced by a set of related technical and economic factors, especially the increasing use of technology and techniques. The recent development of Internet and in Web technologies have brought significant changes in the concepts of traditional reference services and a number of web-based 'expert services'. CAS and SDI services are provided to the users to keep them abreast of latest developments in their field of interest through online search services in digital information environment.

Personalized Services:

Almost researches on digital library development have focused on access to and retrieval of digital information but tthey have overlooked the personalized service aspects, as primary goal of library and information services. On priority basis the personalized services in a digital library environment would help the users to find information resources available in a digitally chaotic world. There is a demand for end user instruction on the use digital libraries and the digital library professional who are subject specialists should help users to formulate disciplinary search strategies and providing digital information resources.

Web-based Reference and Information Services:

Reference and information services are available on the web and these are provided by non-library organization. Now libraries offer real-time reference services using specific software, bulletin board services, interactive communication tools, call centre management software. According to Chowdhury and Chowdhury online reference and information services can be broadly categorized in three groups: i) those provided by libraries and /or expert through the internet, ii) those from publishers, database search services and specialized organizations/institutions, iii) where the users need to conduct a search and find information through web. They also have listed several online information services. CAS, SDI services such as:
a) content pages servies from commercial publishers, e.g. Elsevier's Content Digital Service.
b) information on new books available for free from publishers and vendors, e.g. Notification service from Wiley & Amazon.com.

c) current contents and ISI Alerting services from ISI.

d) SDI services from online search service providers such as Dialog.

The web-based reference services like the Internet Public Library (www.pl.org), Britannica(www.britannica.com), Internet Library for librarians (www.company.com/inforetriever) the Electric Library(http//ask.library.com/refdesk.asp) are available free of charge but some charge nominal fee, e.g. Electric Library charges an annual subscription fee.

Search Engine Services:

The useful search engine services are as follows:

1) Ask Jeevs (www.askjeeves.co.uk) is useful for complex questions and is a good choice for searchers who lack Boolean or other searching skills. The user can ask a question on a given topic and it comes up with a list of questions on the same or similar topics; the user can select any one of them and then it provides answers. It processes each query semantically and syntactically and its answer processing engine provides the correct answer to the user.

2) the Electric Library helps the researchers providing various online reference sources.

3) information please is suitable tool for students and researchers [sherman]

4) web help.com(www.help.com) that claims to offer real time search assistance any time, day, night.

5) about.com(www.about.com) is a service that shows a number of pre-defined categories related to a search topic given by the user. [Chowdhury & Chowdhury]

Digital Reference Services for General Public:

At present, web-based reference services are being provided by a network of public libraries. The users can get answers of his queries through his e-mail messages. British Library, London provides specials reference services for business, scientific, technical, medical, patent and environmental information. British Library provides STM (Science. Technology and Medicine) search services which users need to pay(www.bl.uk) . Similarly, American Library of Congress, Alexandria Digital Library, Berkeley Digital Library, New York Public Library (digital Library), Bibliotheque National de France, Victoria State Library, Vatican Library, etc provide digital reference services to users.

Digital Reference Services for Acadenic Libraries:

Academic libraries also provides web-based reference services. In USA, Seventy academic Libraries provide digital reference services. The university libraries provide reference services through e-mail, appointment and real-time virtual reference. These libraries use CRM (customer relationship management) software packages for providing web-based references services.

Co-operative digital Library Services:

Due to high cost of digital reference sources, lack of trained human resources and infrastructural investment libraries have influenced different organizations to choose a cooperative model of digital reference services. For this some cooperative projects have been launched for providing digital and web-based reference services to users. The Library of Congress, USA has launched the collaborative digital reference services with a mission to provide the users, anywhere, anytime through an interactional digital network of libraries. This network has three main components such as i) member profiles, ii) request manager software for entering, routing and answering reference queries, iii) knowledge based searchable database of question and answer sets. In June, 2002 the library of congress and OCLC have developed a cooperative 'Question Point' the advanced generation of collaborative digital reference services (CDTS) which integrates local as well as global electronic reference networks.

Now-a-days, most of the university libraries have taken steps to provide web-based reference and information services in digital environment in addition to their traditional library services.

- Access to library catalogue and union catalogue
- Access to bibliographic databases
- Access to subject gate ways in specific discipline
- Providing link to websites
- Accessing and procuring e-reference sources
- Subscribing to e-journals
- Reference services provided by librarians and experts on the web
- Document delivery services
- Online current awareness services
- Digitization of library resources, considering their intellectual values.
- Remote information services
- Internally published newsletters, report, and journals
- E-mail
- Bulletin board service
- Netnews system
- CD-ROM databases
- Reference services
- Discussion groups and forum
- E-publishing
- Special collection services
- Electronic document delivery services
- E-thesis and dissertation

Conclusion:

A digital library serves the same purpose, functions and goals as a traditional library. The librarians and administrators of digital libraries should remember their jobs -- is to serve as intermediaries of knowledge who can form a bridge between authors and users of the information society.

References:

1. Arms, William Y. (1995). Key concepts in the architecture of the digital library. *D-Lib Magazine*, July

2. Chowdhury,G and Chowdhury, S. Introduction to digital libraries. Londo:Facet Publishing, 2003

3. Rajshekhar, T.B.(1998). Digital libraries: workflows and software. (available at http://www.ncsi.iisc.erner.in/raya/opendl/d-talk.pdf)

4. Rao, M. Koteswara. ((2004). Digital libraries: challenges, opportunities and implications. *SIS 2004 conference, 22-23 January,2004, IIT Madras, Chennai*

5. Sherman, C. Reference resources on the web. Online.24(1),2000.

6. William, B.K, &Saffady, S. (1995). Digital library concepts and technologies for the management of collections: an analysis of methods and costs. *Library technology reports, vol-31, May-June*, 221

7. http://www.greenstone.org

8. http://www.dspace.org