



## Digital Libraries: A New Era of Promoting Education

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### Abstract

*Digital Libraries are omnipresent. Digital libraries of the future will give access to a large variety of multimedia and multi type documents created by integrating content from many different heterogeneous sources that range from repositories of text, images, and audio video, to scientific data archives, and databases. The realisation of these new digital libraries requires both the provision of a new technology and a change in the role played by the libraries in the information access production cycle. A single isolated Digital Library is valueless. It must be connected “to the world”: to users as well as to content and services provided by other Digital Library systems. Digital libraries will be critical to future humanities scholarship. Not only will they provide access to a host of source materials that humanists need in order to do their work, but these libraries will also enable new forms of research that were difficult or impossible to undertake before. Policy ensuring mechanisms will guarantee that the information produced is visible only to those who have the appropriate rights to access it. Interactive features such as adding annotations to existing material must also be available. The realisation of these new digital libraries requires both the provision of a new technology and a change in the role played by the libraries in the information access production cycle. This chapter gives a history of digital libraries. It pays particular attention to how they have thus far*

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*failed to incorporate several key elements of conventional libraries, and discusses current and future digital library developments that are likely to provide these missing elements. This Chapter discusses how it contributes to the realisation of a novel digital libraries' scenario.*

**Keywords:** Digital Library, HTML, DELOS, OCR, Digital Preservation, World Digital Library, Digital Library Software

## 1. INTRODUCTION

A “digital library” is fundamentally a resource that reconstructs the intellectual substance and services of a traditional library in digital form. Digital libraries consist of digital contents (which are sometimes but not necessarily text-based), interconnections (which may be simple links or complex metadata or query-based relationships), and software (which may be simple pages in HTML or complex database management systems). A single, simple, stand-alone web page is probably not a digital library in any meaningful sense, any more than a single page or a single book is a traditional library. A mass of raw data such as comes from the Hubble telescope is probably also not a digital library, though its contents arguably belongs in one. Digital libraries are not replacements for traditional libraries. They are rather the future of traditional libraries, much as medieval manuscript libraries simply became a specialized and much revered part of the larger print-based libraries that we have today (Seadle, 2006).

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 and so on.

Lynch (1994) defines that, “digital Libraries [provide] users with coherent success 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.

## **2. OBJECTIVES OF DIGITAL LIBRARY**

- To expedite the systematic development of procedures to collect, store, and organize, information in digital form.
- To promote efficient delivery of information economically to all users.
- To encourage co-operative efforts in research resource, computing, and communication networks.
- To strengthen communication and collaboration between and among educational institutions.
- To take leadership role in the generation and dissemination of knowledge
- It gives room for Institutional collaborations and exchange programmes

## **3. FUNCTIONS 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.
- It is easier and more convenient to use.

#### 4. REVIEW OF LITERATURE

The following are the review of existing related literature:

**Mercy, E. Et.al.** carried out a study on the topic entitled, “awareness and digitization of school library resources in Akwa Ibom State, Nigeria”. They concluded that the goal of digitizing library materials is for preservation, visibility, accessibility and effective utilization of the school library resources. The application of this technology in the school libraries will inject the information skills into the students thereby preparing them for future. It was also concluded that librarians to a greater extent are aware the digitization technology available for libraries, though some facilities for digitization are available but pertinent ones are unavailable.

**Roopa E. and Krishnamurthy** concluded in her study entitled “Perspective of digital library services: A review” that many researches are being conducted in the field of digital library and services. These researches are conducted for upgrading the older services and initiating new one. There are many types of digital resources that are being used such as, e-journals, databases, e-books, blogging on internet, websites, digital repositories etc. On the other hand, it is also said that these forms of resources also create issues to manage them according to users’ need. The review study revealed that there are other issues related to infrastructure, creating user awareness, orientation and training to users etc. It is also found that further

**Leung, Yau-ching (2011)** in their study entitled, “Library web/online information services to the needs and behavior of students”. In the survey study it is found that the students of CPCE (Hong Kong) has greatly used library website for their studies. It is said that according to study, the students are found to give preference to ease of access rather than content or attractiveness and also wanted to have desired contents at one place. The websites of libraries are considered as good. It is suggested in the study that the mobile version of the library website is necessary as the mobile technology is emerging popularly.

**Atram, Pratibha N.** carried out on the topic “Digital library services in the digital age”. She summed up her study that ICT has brought many changes in the world of information. It has also brought

revolution in knowledge society. Thinking and way of interaction of people has changed. Every field is affected with ICT. She concluded that world's most of the population is transforming from 'techno-illiterate' to 'techno-literate'. It is said that without ICT, work is not possible. Developments in every field are taken place by adopting new technologies.

**Bhatnagar, Anjana (2005)** studied on web-based library services and concluded that these are in its early stages. It is said that web-based services are volatile as these services may be removed any time from websites. On the other hand, it is hoped that in future the web-based services will be generalized when internet will be easily available. It is also concluded that transformation is taking place in interaction from man to man to human to machine, documents from paper to electronic, material and space from physical to virtual etc. But apart from all these changes in information and communication technology, the reference service will remain same with the importance of human librarians. For this purpose, librarians are desired of having required skills of communication, dealing with web-based services and technology attractiveness.

**Bajaj, Richa** conducted a research on the topic "digitization and literature". In her study it is concluded that the digitization of resources develops in to a repository of education and culture that creates a record to enhance human values and interest for knowledge. In this way different barriers such as socio, economic, cultural, gender and geographic ones are overcome. This digitized knowledge can also be accessed by different people in their learning process with equality.

## **5. DIGITAL LIBRARIES CREATIONS**

One of the largest issues in creating digital libraries will be the building of digital collections. Digital imaging is an inter-linked system of hardware, software, image database, and access sub-system with each having their own components. Tools used for the digital library include several core and peripherals systems like hardware (such as scanners, computers, and data storage), software (image capturing and editing), network (data transmission), and display/printing technologies. Some of the important points to be considered in developing a digital library are as follows:

- (a) **Digital collection:** There are essentially three methods of building digital collections: (i) Digitization, converting paper and other media in existing collections to digital form (ii) Acquisition of original digital works created by publishers and scholars. Example items would be electronic books, journals, and datasets. (iii) Access to external materials not held in-house by providing pointers to websites, other library collections, or publishers' servers.
- (b) **Access to external digital collection:** The digital libraries can obtain access permission to digital collection provided by external sources like institutions, resources of the libraries, electronic journal through on-line access like Elsevier, ACM, etc., which provides their journals on-line through websites.
- (c) **Access to digital information available on the web:** WWW is the repositories of information and one of the important services of the internet. [www.edoc.com](http://www.edoc.com), [mel.library.mi.us](http://mel.library.mi.us), [www.inflibnet.ac.in](http://www.inflibnet.ac.in), etc., are the important portal sites or gateways that provide access to electronics resources. In this respect, we can say that digital libraries can provide access to electronic resources through library home page.
- (d) **Conversion of print to digital:** Mainly scanning and use of OCR programs and re-keying of data are the two important methods for converting the print to digital resources. Some of the technical requirements of the digital image processing include hardware (computer, scanner, input/output devices), software (image capturing, data compression/decompression), network (for transferring information for resource sharing), and display technologies. All the above components are the important machines and tools needed for digitization.

## 6. SALIENT FEATURES OF DIGITAL LIBRARIES

The term 'Digital Library' was used for the first time in 1988 by the report to the Corporation of National Research Initiatives. However, it was popularised in 1994 by NSF/DARPA/NASA Digital Libraries initiative. Digital library is a kind of library where the study material and collections are kept in digital formats. Although, the term is used

for a wide range of collections but the prime requisite of a digital library is that there must be an online collection of information managed by and made accessible to a community of users. It is often used as a synonym for paperless library, electronic library, online library, etc. Users are allowed to get access to a well-organized, synchronized electronically stored repository of information and data. The digital library is making the library to undergo a change in the paradigm of its role to create, organise and distribute information resources in the form of electronic collection. The key features of digitalization of the library are:

- Users must be provided an easy access to the information available in electronic formats.
- Regular procurement of e-books, online journals, digital publications, etc. as per the requirement of users.
- Subscription of legal databases, online journals, e-books, etc. for the proper utilization of the resources.
- Such digital libraries are available irrespective of day, time and place. The users can get a 24×7 access to the information.
- There is no limitation of storage space, physical maintenance and care of the information sources. The best feature of the digital libraries is a user-friendly information retrieval and search method.
- It is a hassle-free arrangement as there is no fear of physical degradation and any requirement of preservation and conservation of material.
- Such library provides a multiple access as the same material can be accessed simultaneously by a number of users as well institutions.

## **7. DIGITAL PROCEDURE**

The process of digitization may be accomplished by scanning the documents, taking digital photos etc. and saving in computer servers in different file formats such as, jpg, tiff, pdf etc. It comprises specialized electronic machinery. Library automation is mainly done by using different library management software types such as,

standalone library management software, ERP software, open access software etc. Few examples of these software are Koha, LibSys, NewGenLib, SOUL, TCSiON, SANJAY, Joomla etc. Now a day various specialized software is developed for performing different activities of libraries.

Fabunmi, Beatrice Ayodeji et.al. (2009) concluded in their study that it is essential to preserve a library and its valuable and endangered resources. This helps in improvising efficient library services and search mechanism. It is also further said that courses of instruction and research opportunities are now made available in this area of specialization by some universities.



**Source:** *Transcending Technology: A cognitive Learning toward artificial Intelligence*

This process usually includes steps such as: Preparation, Scanning, Storage and long-term-preservation, Metadata creation, online publication and data management, Catalogue proof and Reuse.

## 8. KEY FEATURES OF THE DIGITAL LIBRARIES

A digital library is expected to support the following features.

- Provide access to very large information collection(s)
- Focus on providing access to primary (or complete) information not merely surrogates or indexes.
- Support multi-media content



- Network accessible Provide user-friendly interface
- Use declarative representation of document (e.g. tagged small text) in addition or as against image, postscript, etc. forms
- Unique referencing of digital objects
- Enable link representation to local external object (hypertext)
- Clearly separate the digital library and the user interfaces by employing client server architecture.
- Support traditional library mission of collection development organization. Access and preservation.
- Support advanced search and retrieval
- Available for a very time
- Integrate personal group enterprise public digital library.

## **9. TECHNICAL ISSUES IN THE DEVELOPMENT OF DIGITAL LIBRARIES**

Some of the major Technological challenges and issues drawing the attention of workers in this area include:

- High band with computer network supporting efficient multimedia document transfer
- Open communication protocols (client-server, e.g. z39.50for IR)
- Information access tools (browse, display and search tools)
- Meta database (data based that describe and provide links to other databases/ Information sources)
- Electronic publishing tools (personal, institutional, publisher)
- Data compression
- Digital storage
- Scanning and conversion technologies
- Media integration technologies (multi-media)
- Advanced retrieval, indexing, natural language processing, routing and filtering
- Document description and representation standards (e.g. SGML)

- Inter-operability (how do multiple digital libraries interact)
- Privacy, authentication and security.

From the foregoing, it has been made abundantly cleared that digital library or E library operation is far better than the traditional system, especially at this auspicious period when hardcopy documents or paper-based materials are gradually facing out in all fares of human sectors. Though, E library is not without its own shortcomings, for instance, in Nigeria or any other African countries where epileptic power supply and poor Internet technology Architecture or unstable Telecommunication Infrastructure are evident, digital operations cannot thrive.

Therefore, Governments in all the tiers of governance including the Federal and State legislative houses respectively should make policies and legislate bills that can improve on the power supplies and the Internet Architecture Infrastructures in the Country, because this is the platform and bane through which Nigeria can meet up with the developed Nations of the world technologically in the 21st century.

## **10. OCR AND DIGITAL PRESERVATION**

Amarjot Singh, Bacchuwar and Bhasin (2012) defines “Optical Character Recognition or OCR is the electronic translation of handwritten, typewritten or printed text into machine translated images. It is widely used to recognize and search text from electronic documents or to publish the text on a website.” OCR enables scanned document which is in an image form to fully searchable documents with text recognized by computers. OCR also upheld the conventional way of manual typing by extracting relevant information from documents and feeding it into the electronic database. Pictorial representation of digitization workflow is shown in



**Figure 1:** Digitization workflow Process.

Source: (Bandi, Angadi, and Shivarama, 2015)

## 11. IMPORTANCE OF OCR IN DIGITAL PRESERVATION

OCR plays a vital role in the digitization process as it helps to reduce the file size of the document and makes it searchable (Bandi et al., 2015). Scholars belonging to Humanities subject heavily rely on the digital archives because it is time-consuming to visit archives physically. But, such practice and dependency on digitally processed literature in the research is compensated by some hidden cost like achieving deviated result due to the noisy representations of the source texts (Traub, Ossenbruggen, and Hardman, 2015).

Digital copies of fragile artefacts can be manipulated in many ways to enhance damaged material but it is not so for their physical counterparts. This is also true for digitized handwritten documents, where the enhancement of illegible materials can be done through various image processing algorithm and can provide error-free improved information for the scholarly community. (Brown and Seales, 2001).

Digital Library of India is emerging as a large digital library for archiving collection of printed and handwritten documents. There is a requirement of an effective search and retrieval mechanism which can understand textual data from document image collections. The success of such an idea is highly dependent on the performance of OCRs, which convert the document image into text. (Balasubramanian,

Meshesha, and Jawahar, 2006). The following are the reasons for the digitization of manuscripts and other cultural heritage resources:

- To promote access to manuscripts
- To preserve the document in the longer-lasting medium.
- To reduce physical usage of very fragile or frequently used original manuscripts.
- To preserve and conserve cultural heritage through digitization and maintain its historical value.
- To access information simultaneously by multiple users.
- Number of copies might be generated with the digitized version of documents

## **12. TRAINING AND SKILL OF ICT**

New concepts such as the hybrid library and the digital library have emerged. The changes in library work have occurred all over the world, and the underdeveloped countries are no exception to this. Nevertheless, the library in the underdeveloped has been lagging behind the fast changes brought about by advances in ICT 'Skills and Training' is defined as the systematic development of employees' knowledge, skills, and attitudes that are required for the library to meet its day to day works.

Information and communication technology is a term used to describe a range of equipment and computer programs and the telecommunications infrastructures that allow us to access, retrieve, store, organize, manipulate, present, send material and communicate locally, nationally and globally through digital media Effective application of ICT in libraries helps in performing their operations and services more efficiently.

## **13. EXITING DIGITAL LIBRARY PROJECT**

Several digital library projects have been undertaken since the past couple of years mainly in USA and Europe. Chief among these are the NSF/ARPA/AASA funded project initiatives.

**NSF/ARPA/NASA Digital Libraries project initiatives**

Funded through a joint initiative of the national science foundation (NSF), Department of defence Advanced Research Project Agency (ARPA), and the National Aeronautics and space Administration (NASA), U.S.A., The Initiative's focus is on to dramatically advance the means to collect, store, and organize information in digital forms, and make it available for searching, Retrieval and processing via communication networks all the user friendly ways.<sup>9</sup> It may be noted that all these projects include strong participation by external agencies from the industry, and other research in states.

**Information digital video library**

Located at Carnegie Mellon University, the objective of this project is to develop technologies for full content search and retrieval from digital video libraries. The project team is creating a test bed to enable K-12 [10+2 level in India] student to access, explore, and retrieve science and Mathematics Materials from the digital video library combining speech, image and natural language capabilities. It will initially contain 1000 hours of video.

**Illinois digital Library Project**

This is located at University of Illinois, Urbana Champaign Focus here is on providing comprehensive search and display of complete contents of articles, including text figures equations and tables to articles from engineering and science journals obtained in SGML format directly the major partners are publishing industry. Some of the software and protocols used include mosaic, BRS search, etc"

**Alexandria Digital Library Project**

Located at University of California Santa Barbara, goal of project is to provide access to collections of variety of spatial information, including digitized maps, images, air photos, and other graphical information, relating to the counties of Santa Barbara, Ventura and LOS Angeles in California State. The range of uses include school children academic researchers and the general public.'

**University of Michigan Digital Library Project (U.M.D.L.)**

The UMDL project focuses on earth and space sciences. A related project, the journal storage project with dignities and make available al issues from the first publication through 1990 of 10 economics journals.

**University of Berkeley digital project**

The goal of this project is to develop technologies for intelligent access to massive distributed collections of melt-media documents in including Photographs, satellite, images and Videos, full text documents, comprising multiple terra byte databases.'

**University of California CD-ROM Information System**

This system provides online access to a CD-ROM based database through the web consisting of published federal (U.S.gov) statistics covering 1990 census and foreign trade data, equivalent of about 26000 books, Roughly 135 GB of data is stored on 270 CD-ROM discs handily by 45 Pioneer 6 disks CD-ROM juke box changers connected to 4 sun SPARC work stations.'

**World Digital Library (WDL)**

The World Digital Library (WDL) is an international digital library launched and operated by the UNESCO and the U.S. Library of Congress. It is one of the hallmark digital preservation initiatives with a global perspective. The World Digital Library archives and provides access to the primary cultural content in a wide number of formats contributed by a large number of partner institutions from different countries around the globe. The main aim of the WDL is to expand the volume and variety of cultural content on the Internet to promote international and intercultural awareness. The WDL provides resources for educators, scholars and general audiences to narrow the information divide (<https://www.wdl.org/en/about/>). The WDL provides access to unique content contributed by 159 institutions including libraries, archives, museums, educational institutions, and international organizations from 193 countries around the world in more than 145 languages. It hosts 19147 items of historical importance from 8000 BCE to 2000 CE and even afterward. This collection is present in the form of Books, Journals, Manuscripts, Maps, Musical

scores, Motion pictures, Sound recordings, Prints, Photographs, and Architectural drawings (Nahida, Bisma and Loan, 2019). The WDL is a true cultural treasure and a valuable platform for dissemination and conservation of access to the vast content of immense historical importance.

### **CORE Project**

This project is being carried out at Comall University to understand issues involved in providing access to an electronic library of primary journal articles in chemistry. The project covers five year of 20 primary journals published by the American chemical society, consisting of about 425000 pages. The data is maintained in two forms scanned images stored on Sony WORM juke boxes and as SGML Marked up ASCII files, for each page, stored on a SUN Unix file server. Another SUN Machine is used as a print server. The system supports full text, Boolean searching. The system is on an Ethernet LAN with SVGA monitor based user terminals.

### **British Library's Imitative for Access**

This is a program of 20 development protects, initiated in 1993, to investigate hardware and services software platforms for the digitization and subsequent networking of a range of library materials. The patent Express juke box is one of the major projects providing in house access to over one million of the current U.K. US, and European patents held on 16 linked CD-ROM jukeboxes, each holding 100 discs containing 800patents.

### **The Red Sage Digital Journal Library Project**

This is a four-year project which began in the beginning of the year 1973 at University of California, san Francisco (UCSF) dedicated to the health sciences, in collaboration with AT and T bell labs and about 20 publishers including Springer-Verlag, Blackwell scientific, Chapman and Hall, American chemical society, Oxford university press etc.

## **14. DIGITAL LIBRARY PROJECTS IN INDIA**

In India the work of converting conventional libraries into digital ones was still in the formative stage, as the Planning Commission

has taken the first and major step towards connecting all the libraries and to provide a linkage through programme called “**Vikas Vahini**”, which is expected to complete by five years. The Indian Institute of Science, Bangalore has set up a digital library, the first of its kind in the country, which uses IBM Digital library software. With good communication links, the IISc’s digital library will be accessible from anywhere in the country and around the world. The IISc produces about 1,000 papers a year and around 200 doctoral theses available from digital library along with scientific journals published by the institute. The digital library can be accessed over the net from the URL <<http://www.iisc.ernet.in>>.

### **National Digital library of India (NDLI)**

The National Digital library of India (NDLI) is a project under Ministry of Human Resource Development, India. The objective is to collect and collate metadata and provide full text index from several national and international digital libraries, as well as other relevant sources. It is a digital repository containing textbooks, articles, videos, audio books, lectures, simulations, fiction and all other kinds of learning media. The NDLI provides free of cost access too many books in English and the Indian languages.

## **15. DIGITAL LIBRARY SOFTWARE**

### **Greenstone Digital Library Software**

The Greenstone digital library software is an open-source system for the construction and presentation of information collections. Greenstone is produced by the New Zealand Digital Library Project at the University of Waikato, and developed and distributed in cooperation with UNESCO and the Human Info NGO. It is open-source, multilingual software, issued under the terms of the GNU General Public License. The aim of the Greenstone software is to empower users, particularly in universities, libraries, and other public service institutions, to build their own digital libraries. It allows extremely varied digital collections to be published on the Internet or on CD-ROM.



### **DSpace**

DSpace is an open source repository software package typically used for creating open access repositories for scholarly and/or published digital content. DSpace repository software serves a specific need as a digital archives system, focused on the long-term storage, access and preservation of digital content. Some most important features of DSpace are as follows:

- Free open source software
- Completely customizable to fit user needs
- Manage and preserve all format of digital content (PDF, Word, JPEG, MPEG, TIFF files)
- UTF-8 Support
- Interface available in 22 language

### **EPrints**

EPrints is a free and open-source software package for building open access repositories that are compliant with the Open Archives Initiative Protocol for Metadata Harvesting. EPrints has been developed at the University of Southampton School of Electronics and Computer Science and released under a GPL license.

### **Fedora: (Flexible Extensible Digital Object Repository**

**Architecture)** open source software gives organizations a flexible service-oriented architecture for managing and delivering their digital content. At its core is a powerful digital object model that supports multiple views of each digital object and the relationships among digital objects. Digital objects can encapsulate locally managed content or make reference to remote content. Dynamic views are possible by associating web services with objects. Digital objects exist within a repository architecture that supports a variety of management functions. All functions of Fedora, both at the object and repository level, are exposed as web services. These functions can be protected with fine-grained access control policies. This unique combination of features makes Fedora an attractive solution in a variety of domains. Some examples of applications that are built upon Fedora include library collections management, multimedia authoring systems,

archival repositories, institutional repositories, and digital libraries for education.

## **16. PROBLEMS AND PROSPECTS**

Indian perspective of Information Technology impact on libraries and information centres at the beginning of 21st century can be accessed on the existing infrastructures of libraries and information centres. In India the phase change of the above system namely on its physical attributes, professionalism, service orientation will be complex due to lack of co-ordination, policy guidance at national level. Some of the proposals are lying on papers, decades together. However, the impact of IT will bring about phase change of libraries and information centres. As referred, the information explosion at global level specifically activity oriented socio-economic and political fronts will be the force that acts upon libraries and information centres. Secondly the commercial orientation as the trend of the future of libraries and information centre's is another mile stone added to the former, i.e., behaviour of information seekers. Thirdly, the technical expertise which is less oriented to that of standards of requirement man power planning has fell short due to lack of coordination between the IT developments and to the professional career training institution. Besides, India has to be in the information highway as a sea of information is knocking at its doors. India has the expertise to meet the challenge and to set up digital libraries in the country. We are threshold of breaking into cyberspace and navigate through internet and worldwide web. World Wide Web is the most advanced browsing and searching system deployed on Internet based on hypertext paradigm. WWW allows due to explore a seemingly unlimited worldwide digital "WEB" of human knowledge. With all these facilities it is possible to access hundreds of databases and make the information available to the user community in the country.

The tools are there and technology is there, so there is no excuse for us, in India, not to start planning for digital libraries. A number of biomedical institutions in the country have already made a start and notable among these are national informatics centre, All India Institute of Medical Sciences in New Delhi, National Institute of Medical health and Neurosciences in Bangalore and M.G.R. University in Madras.

NATIONAL INFORMATICS CENTRE NIC through NICNET, NIC is a Satellite based communication network has 500 odd VSAT at state and district offices. NIC has digital capabilities to support any kind of computer-communication facilities.

- On-line access to MEDLINE and AIDS databases.
- Full text of selected journal articles
- Information from other NLM databases.
- Interactive access to CD-ROM databases.
- On-line search of catalogue of biomedical databases.
- Union catalogue of Journals available in various biomedical journals.
- Assistance in setting up MEDLARS search facilities.
- User awareness programmes.
- End users training.

#### **17. ADVANTAGES AND DISADVANTAGES OF DIGITAL LIBRARY**

Advantages of a Digital library over a Traditional library are listed below:

- 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

**Disadvantages of a Digital library over a Traditional library are listed below:**

There are some disadvantages of digital libraries also, which are as follows:

- User authentication for access to collections
- Digital preservation
- Equity of access
- Interface design
- Interoperability between systems and software
- Information organization
- Training and development.

## **18. CHALLENGES IN DIGITAL SERVICES**

Open access resources in information and communication technology age, information in the digital form is rapidly replacing the traditional printed counterparts. The challenges hindering the effective application of ICT in the library that can face libraries as they become progressively involved with the use of technologies may be summarized as follows: Inadequate Funds, the main challenges for implementing ICT in the library. The first issue, which almost all libraries face, is how to deal with the scarcity of financial resources Lack of Policy and Strategies, Library need to develop their own local ICT policy and strategies that define how they are going to use or implement ICT. It is no longer acceptable to computerize for the sake of computerization. To support the integration of application of ICT in libraries, always libraries are facing challenges ICT infrastructure. This refers to issues such as lack of national ICT policy, low internet connectivity, inadequate no of PCs and inadequate supply of electricity, there need for policies that regulate satellite communication and other telecommunication links. Poor ICT Knowledge, there is severe and pronounced “low-level computer literacy among the library staffs. This makes it difficult for them as a user of the library to make full utilization of available ICT facilities. This problem is further aggravated by the shortage of ICT literate staff in libraries. With the emergence of application of the information and communication technology the library and information professionals have changed altogether their role is not just as custodian of the library but to teach how to use the existing resource.

## **19. CONCLUSION**

Libraries around the world have been working on this daunting set of challenges for several years now. The library/information centre has to overcome the inhibitions and look ahead for the betterment of information services to the user community by successfully adopting the digital technology - the need of the hour and keep pace with world. It seems that the days may not far when the whole world would have digital libraries interconnecting all libraries to meet the academic and research needs within the short time. However, before digital libraries took over the library and information network, the country's archives laws need to be changed to meet the current challenges in the areas of copyright protection of data and prevention of corruption of data.

Considering that India has been a late entrant into the arena of digital library creation and also considering that the pace at which digital libraries are being created is less than desirable, it is evident that there are problems in digital library development in India. 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.

The Library/Information Centre has to overcome the inhibitions and look ahead for the betterment of information services to the user community by successfully adopting the digital technology-the need of the hour and keep pace with world. It seems that the days may not far when the whole world would have digital libraries interconnecting all libraries to meet the academic and research needs within the short time. However, before digital libraries took-over the library and information network, the country's archives laws need to be changed to meet the current challenges in the areas of copyright protection of data and prevention of corruption of data.

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