

Digital libraries: Challenges for 21st century

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Abstract

We discuss in the present paper about the digital libraries and its future. The emerging field of digital libraries brings together participants from many existing areas of research. Currently the field lacks a clear agenda independent of these other area. It is tempting for researchers to think that the field of digital libraries is a natural outgrowth of an already known field. From a database or information retrieval perspective, digital libraries may be seen as a form of federated databases. From a hypertext perspective the field of digital libraries could seem like a particular application of hypertext technology. From a wide-area information service perspective, digital libraries could appear to be one use of the World Wide Web. From a library science perspective, digital libraries might be seen as continuing a trend toward library automation.

Keywords: Digital Library, Electronic Library, Modern Library, Virtual Library.

Introduction

Digital library is newly emerging perspective in the modern world and its future. Apart from this view there is some truth to these perspectives (as well as others) but none address the field as a whole and its research agenda. The field of digital libraries will be limited if viewed only as a sub field of prior research interests. To realize its full potential, the field must be viewed as a union of sub fields from a variety of domains combined with additional goals, and thus new research issues. Digital library research must both respect the existing tradition of our physical libraries and transcend current practice in developing a new, broader research agenda.

What are the research issues central to digital libraries? One issue might be how to digitize objects and put them on-line. A second might be how to include new forms of information that do not have temporal or tangible representation necessary for inclusion into physical libraries. Another could be how to locate materials in the new digital library. Yet another would be when to use and when to transcend the existing technologies and traditions of the physical library in its digital form. Still other issues stem from the problems of information overload created by new information technologies. This framework presents for thinking about the field of digital libraries and the research issues that are part of it and demonstrates how these issues affect digital library systems. The recent decades have witnessed tremendous advanced in information technology and its application. The latest technologies offer cheaper price computer processing power, mass storage inexpensive access to high speed networks and retrieval devices which gives us the ability to crate, manipulate, store and transfer large quantities of formation in digital form at low cost, electronic publishing and resource sharing activities have become very easy and convenient today. These major changes have led create and develop digital libraries. Digital

libraries basically store of materials in electronic format and manipulate large collection of those materials effectively. The key technological issue is how to search and display the desired selections from and across e collections. The main focus of digital libraries should be on issues of access, cost and digitization technology and how to develop the necessary infrastructure for effective mass manipulation of the information network.

What is Digital Library?

Digital Library: This is a computer era. So, we can say that digitalization is the part of computerization. Digitalization means, there we can find the information through computer in digit form. Digital Library, a global virtual library, is a library of thousands of networked electronics libraries. There will be a vast population of users scattered around the globe, who are able to access, easily and conveniently, the complete contents of thousands of repositories containing texts, images, sound recordings, videos, maps, scientific and business data, as well as hypermedia combinations of these elements. The library must a network based distributed system with local servers responsible for maintaining individual collections of digital documents.

A digital library is a collection of digital objects. A collection of research papers is a typical example. When this collection gets sufficiently large, users of the digital library cannot examine each paper individually to find if its subject interests them. To address this problem, digital librarians create an interface to stand between the content of the collection and the user. In a traditional library, an example of this would be a card catalog – a collection of small cards that represent the larger objects contained in the collection. These cards are more manageable than the books that they represent. In a digital library, there are a number of ways that we can present the digital collection to the user The first thing that we need to do is to describe each object in a

manageable way. This description is called metadata – data (the description) about data (the digital object). This metadata is more manageable than the digital objects that it represents. Metadata is written in a standard format. This allows the metadata to be manipulated using automated tools.

In the past, the problem had been involved in that digital libraries have been very expensive to develop. This is because people were programming them all from scratch. Lots of people and organizations have digital collections. Why should each digital library be a reinvention of the wheel? Another problem is interoperability. When many organizations have collections, users must search each one until they find what they need. What if the users could go to one place and look through lots of collections at once? For this to happen, the programmers that developed one digital library would have to talk to the programmers of the other library to get the collections to talk together. Then two digital libraries could interoperate, but what about all of the others? This is where the idea of Open Archives Initiative created a standard protocol, a way that collections provide descriptions about their contents. This is the basis for the creation of interoperable digital libraries. By standardizing the interface to the metadata, tools to work with this data can be created only one. Organizations that can't afford programmers can now have digital libraries, using these standard tools. Digital library is collection of standard tools using a standard interface and underlying protocol needed to create a digital library that is interoperable with other digital libraries.

The future of digital library history will be determined not by the technology involved, but by the ideology. If the will be determined not by the technology involved, but by the ideology. If the prevailing definition of a digital library is an organized searchable collection in digital format, then the future of digital libraries will reflect a move toward integrated service functions and collection development and management similar to the traditional library organization.

Definitions

According to Don Waters defined that “Digital libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, 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”

“A Digital library is a machine readable representation of materials which might be found in a university library together with organizing information intended to help users find specific information. A digital library service is an assemblage of digital computing, storage, and communicating machinery together with the software needed to reprise, emulate, and extend the

services provided by conventional libraries based on paper and other material means of collecting, storing, cataloging, finding, and disseminating information.” Edward A. Fox

Characteristics of Digital Library

Characteristics of digital library discussed here as noted below:

- Users are usually elsewhere than the information they want, and often wish to correlate things from several sources.
- Whoever wants to use a library must show permission to do so.
- Different patrons are permitted different actions and to see different parts of each collection.
- To find specific information, each user must understand the catalog structure.
- To find specific information, each user must understand the catalog structure.
- The catalog may describe items not actually held as part of the collection at hand.
- The catalog and the collected items are used differently and not necessarily housed in the same place.
- Documents are cataloged with text descriptors and also with conventional properties such as author names.
- Documents contain cross-reference to other documents.
- Document identifiers are different from document names.
- Translations of a document may express essentially the same information, e.g. Versions of classic literature in different languages.

Components of Digital Library:

Digital library requires well-established and proven information technologies by accessing the database or servers through networks. The following components are very essentials to create digital library:

Hardware Requirement:

The noted below are the requirement of digital library as follows:

- 24 hours Internet connectivity
- Computer servers
- LAN or WAN
- Scanners
- Storage media: high power hard disk
- Wi- fi tower and CDs
- Digital camera
- High power Ups
- Converters
- Networks
- Multimedia interfaces

Software:

The software requirement of the DL as indicated below:

- Linux operating systems
- Digital library software like Greenstone and D-Space
- Editing software

Human ware:

The key skills are required for digital library staff as indicated below:

- Management skills
- Technical Skills
- Subject Skills

Objectives of Digital Library:

The objectives of digital library as mentioned here in:

- To collect, store, organize and access information in digital form via communication channels.
- To meet the requirements of patrons by providing better services.
- To provide personalized and retrospective services in efficient way.
- To have large digitized databases.
- To save time of library staff by avoiding routine jobs.
- To provide coherent view of all information within a library in any format.
- To serve widely dispersed communities throughout the network.
- To minimize massive storage and space problem of large libraries.
- To reduce cost involved in varies library activities.

Digital Libraries Future and Development Issues:

There are many thousands of digital library projects currently underway, in all sectors of the library community. The basic concept underlying the digital library is not new. In 1945, Dr. Vannevar Bush of the U.S. Office of Scientific Research and Development discussed a device called a “memex”. He envisioned this device being used by individuals as “a sort of mechanized private file and library”.

Of these many terms, digital library, virtual library, hybrid library and electronic (or e-) library are most common. In the 1990s, terms such as digital library, virtual library and electronic library became widely used, but considerable uncertainty remains about what they actually mean.

A digital library is not confined to just digitize collection of rare materials. It should be built according to principles that are not necessarily the same as those employed for paper collections, and it should be valued according to different measures that are no yet totally clear and not defined perfectly.

Digital conversion process:

Digital conversion process, which includes

- Document
- Data capture
- Data Processing

- Storage
- Indexing and Processing
- Retrieval and display

Documents: In include text, bibliographic or full text, photographs, diagrams, charts, maps, colour images etc. They exist either in print or non-print form or also as single unit or collection.

Data Capture: It includes manual data entry (word processing), optical character recognition (OCR) or imaging using scanners.

Data Processing: The text in the convertible document may require conversion of diacritics or special characters: images may need enhancement, amplification or compression. In many cases a simple conversion from print to digital is not enough.

Storage: The digitized information needs to be recorded in proper digital storage medium, which may be hard disk, magnetic tape, optical CD-ROM, or networks with workstation to access.

Indexing and Processing: Digitized document need to be processed using standards, protocols and indexing systems. Classification using library systems also hold much promise. Metadata application should be a major component of the digital information processing.

Retrieval/Display: It is the process through which an array of technologies for browsing, displaying, and applying packages that ultimately helps in access.

Merits of Digital Library:

The main advantage of the DL as indicated below:

- Helps in Resource sharing facilities.
- It saves the library manpower and funds.
- Helps in inter-library loan (ILL).
- Helps to reach information of their users at faster rate through on-time communication.
- It minimizes the duplication of new invention.
- Helps the Libraries to get recent publications from the publishers.
- E-publications provide aids for connectivity, audio visualization, customizability, creation and revision of documents, interactivity and rapid information retrieval.
- E-publications may help in overcoming the restrictions on the length of the paper imposed by many scholarly journals.
- The E-publications data can be maintained up-to-date so that the buyer will be able to purchase the latest version of the publications. This enables on demand publishing and allows retrospective searching and SDI.

Conclusion

The above paper discussed the importance of digital libraries future and its main functions, tools and technologies used for data capture or content creation and management of publication. We also pointed out the technical and non-technical factors affecting the many

technologies such as VRBA, LBC, Cryptolope and trusted system. We also enumerated the merits and demerits of digital library with high point of view. The emerging of Information Technology with high resolution capture and sophisticated engines and large storage digital contents continue to ability of conform the digital library and in the future digital libraries will be common in every Institutes, College and Universities.

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