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Digital libraries: Challenges for 21st Century

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ABSTRACT

The purpose of this presentation is to discuss digital libraries and their future. The burgeoning topic of digital libraries brings together researchers from a variety of fields. Currently, the field does not have a distinct objective that is separate from these other areas. It's tempting for researchers to believe that digital libraries is a natural extension of a well-established profession. Digital libraries can be thought of as federated databases from the standpoint of database or information retrieval. From a hypertext standpoint, digital libraries may appear to be a specific application of hypertext technology. Digital libraries may appear to be one usage of the World Wide Web from the perspective of a wide-area information service. Digital libraries may be considered as continuing a trend toward library automation from the perspective of library science.

1. Introduction

The digital library is a novel concept in the current world that has a bright future. Apart from this point of view, there is some validity in these (and other) perspectives, but none of them address the field as a whole or its research agenda. If digital libraries are merely considered as a subfield of prior research pursuits, they will be constrained. To reach its full potential, the area must be understood as a synthesis of subfields from other domains, combined with extra goals and, as a result, new research questions. In order to build a new, broader research agenda, digital library research must both respect and exceed the existing tradition of our physical libraries. What are the most important research issues in digital libraries? One challenge might be how to digitise and upload objects to the internet. A second issue would be how to incorporate new types of information that lack the temporal or tactile representation required for physical library inclusion. Another issue could be figuring out where to look for materials in the new digital library. Another would be when to use and when to transcend the physical library's current technologies and traditions in its digital version. Other challenges arise as a result of the information overload caused by new information technology. Digital libraries, on the other hand, store and modify enormous collections of materials in an electronic format. The most important technological difficulty is determining how to find and show desired selections from and across digital collections. Digital libraries should concentrate on concerns such as access, cost, and digitalization technology, as well as how to build the required infrastructure for successful mass manipulation of the information network.

2. What is a Digital Library, exactly?

This is a computer era, hence there is a digital library. As a result, we can classify digitalization as a subset of computerization. The term "digitalization" refers to the

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ability to access information in digit form via a computer. A global virtual library, Digital Library, is a collection of thousands of networked electronic libraries. A wide population of users will be able to access the whole contents of thousands of repositories holding texts, photographs, sound recordings, videos, maps, scientific and business data, as well as hypermedia combinations of these elements, effortlessly and conveniently from anywhere on the planet. The library must have a network-based distributed system with local servers that manage individual digital document collections.[1]

A collection of digital things is referred to as a digital library. A typical example is a collection of research publications. Users of the digital library will be unable to review each document individually to see if its subject interests them once the collection has become large enough. To overcome this issue, digital librarians design an interface that serves as a barrier between the collection's material and the user. A card catalogue — a collection of miniature cards that reflect the larger things in the collection – is an example of this in a typical library. These cards are a lot easier to handle than the books they represent. In a digital library, we can show the digital collection to the user in a variety of ways. The first step is to provide a manageable description for each object. Metadata (data about data) is the name given to this description (the digital object). This metadata is easier to handle than the digital objects it describes. Metadata follows a standard format.[2] This enables automated tools to alter the metadata.

In the past, the issue has been that developing digital libraries was extremely expensive. This is due to the fact that they were all programmed from scratch. Digital collections exist in the hands of many people and organisations. Why should each digital library be a fresh take on an old concept? Interoperability is another issue. When a large number of organisations maintain collections, users must search through each one until they locate what they're looking for. What if consumers could go to one location and browse multiple collections at the same time? To accomplish this, the programmers who created one digital library would need to communicate with the programmers of the other library in order for the collections to communicate with one another. Then two digital libraries could collaborate, but what about the rest of the libraries? This is where the Open Archives Initiative came up with a common approach for providing descriptions of collections' contents. This serves as the foundation for building interoperable digital libraries. By standardising the metadata interface, only one tool to work with the data may be created. Using these standard techniques, organisations who can't afford programmers can now have digital libraries. A digital library is a collection of standard tools that use a standard interface and protocol to create a digital library that can communicate with other digital libraries.[3]

2.1. Definitions

"Digital libraries are organisations that provide the resources, including specialised 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," according to Don Waters. "A digital library service is an assemblage of digital computing, storage, and communication machinery, as well as the software required to reprise, emulate, and extend the services provided by traditional libraries based on paper and other material means of collecting, cataloguing, finding, and disseminating information." Edward A. Fox is an American actor.[4]

3. Characteristics of Digital Library

The following are some of the qualities of a digital library that are described here:

1. Users are usually looking for information other than what they're looking for, and they frequently want to combine data from multiple sources.
2. Different patrons are allowed to do different things and see different parts of each collection, thus they must show authorization to use the library.
3. Each user must grasp the catalogue structure in order to find specific information.
4. The catalogue may describe things that aren't actually part of the current collection.
5. The catalogue and the objects collected are used in different ways and are not always kept in the same location.
6. Text descriptors and traditional attributes such as author names are used to catalogue documents.
7. Cross-references to other documents are included in documents.
8. Document names are not the same as document identifiers.
9. Document translations, such as renditions of great literature in multiple languages, may represent essentially the same information.

4. Components of Digital Library

By accessing the database or servers through networks, a digital library requires well-established and tested information technology. To construct a digital library, you'll need the following elements

4.1. Hardware requirement

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

1. 24 hours Internet connectivity

2. Computer servers
3. LAN or WAN
4. Scanners
5. Storage media: high power hard disk
6. Wi fi tower and CDs
7. Digital camera
8. High power Ups
9. Converters
10. Networks
11. Multimedia interface

4.2. Software

The software requirement of the DL as indicated below:

1. Linux operating systems
2. Digital library software like Greenstone and D-Space
3. Editing software

4.3. Human ware

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

1. Management skills
2. Technical Skills
3. Subject Skills

5. Objectives of Digital Library

As stated previously, the goals of a digital library are to gather, store, organise, and access material in digital form via communication channels.

1. To provide better services in order to suit the needs of clients.
2. To give efficient tailored and retrospective services.
3. Having a huge number of digitised databases.
4. To save library personnel time by eliminating mundane tasks.
5. To provide a unified view of all information in a library, regardless of format.
6. To service communities that are distributed over the network.
7. To minimise massive storage and space problem of large libraries.
8. To cut the expense of various library operations.

6. Digital Libraries Future and Development issues

Thousands of digital library initiatives are currently in the works throughout all segments of the library community. The fundamental principle that underpins the digital library is not new. Dr. Vannevar Bush of the United States Office of Scientific Research and Development talked about a device dubbed a "memex" in 1945. Individuals could use this item as "a sort of mechanised private file and library," according to him.[5]

The most commonly used terms are digital library, virtual library, hybrid library, and electronic (or e-) library. The terms "digital library," "virtual library," and "electronic library" became popular in the 1990s, yet there is still a lot of confusion regarding what they signify.

A digital library is more than just a collection of rare books that have been digitised. It should be built using concepts that aren't always the same as those used for paper collections, and it should be valued using a variety of measurements that aren't yet completely clear or properly defined...

6.1. Digital conversion process

Digital conversion process, which includes

1. Document
2. Data capture
3. Data Processing
4. Storage
5. Indexing and Processing

6.2. Retrieval and presentation

Text, bibliographic or complete text, photographs, diagrams, charts, maps, and colour images are all examples of documents. They are available in print and non-print formats, as well as as a single unit or a collection.[6]

Manual data entry (word processing), optical character recognition (OCR), and scanning are all examples of data capture.Text in the convertible document may require diacritics or special characters to be converted, and images may require enhancement, amplification, or compression. In many circumstances, a basic print-to-digital conversion is insufficient.

Storage: The digitised data must be saved on a suitable digital storage medium, such as a hard drive, magnetic tape, optical CD-ROM, or a network with workstations. Documents that have been digitised must be handled utilising standards, protocols, and indexing systems. The use of a library system for classification also has a lot of potential. The use of metadata should be an important part of the digital information processing process.

Retrieval/Display: This is the process of using a variety of technologies to browse, display, and apply packages in order to gain access.[7]

6.3. Benefits of a digital library: The following are the key benefits of a digital library

1. Assists in the sharing of resources.
2. It saves the library both time and money.
3. Assists with interlibrary loan (ILL).

4. Facilitates faster access to information for users through real-time communication.
5. It reduces the likelihood of new inventions being duplicated.
6. Assists libraries in obtaining latest publications from publishers.
7. E-publications help with connectivity, audio visualisation, customizability, document production and editing, interactivity, and information retrieval quickly.
8. E-publications may be useful in bypassing the length limitations imposed by many scholarly journals.
9. E-publications data may be kept up to date so that buyers can acquire the most recent versions of the publications. This allows for on-demand publication, as well as search and SDI in the past.

7. Conclusion

The preceding paper explored the relevance of digital libraries in the future, as well as their key purposes, tools, and technologies for data gathering, content development, and publication management. We also discussed the technical and non-technical variables that influence a variety of technologies, including VRBA, LBC, Cryptolope, and trusted systems. With a high point of view, we also itemised the benefits and drawbacks of digital libraries. With the advancement of information technology, such as high-resolution cameras, powerful engines, and vast storage capacities, digital libraries are becoming more prevalent, and digital libraries will be found at all Institutes, Colleges, and Universities in the future.

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9. Conflict of Interest

None.

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