Digital Library

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Abstract:- During the past recent years, there has been tremendous development reaming the concept of digital libraries-a knowledge base that can be stored and retrieved through on-line networks. Digital libraries are the most complex form of information systems that support digital document preservation, distributed database management, hypertext, filtering, information retrieval and selective dissemination of information. This has really overcome geographical barrier offering wide range of academic, research and cultural resources with multimedia effects which can be accessed around the world over the distributed networks. The paper examines the concept of Digital library, the technology that has enabled its emergence & architecture of digital library system. It also highlights the digital library projects undertaken in USA, UK and India. Here the authors explored the unique feature of digital library and possible challenges ahead for library and information professionals in the digital environment.

Keywords: Digital, E –resources

I. INTRODUCTION

1.1 OVERVIEW

A **Digital library** (also referred to as **electronic library** or **digital repository**) is a focused collection of digital objects that can include text, visual material, audio material, video material, stored as electronic media formats (as opposed to print, micro form, or other media), along with means for organizing, storing, and retrieving the files and media contained in the **library** collection. Digital libraries can vary immensely in size and scope, and can be maintained by individuals, organizations, or affiliated with established physical library buildings or institutions, or with academic institutions. The electronic content may be stored locally, or accessed remotely via computer networks. An electronic library is a type of information retrieval system.

The term *digital libraries* was first popularized by the NSF/DARPA/NASA Digital Libraries Initiative in 1994 (Wikipedia, 2014).
In the digital library, information is stored as "digital objects". A primitive idea of a digital object is that it is just a set of bits, but this idea is too simple. The content of even the most basic digital object has some structure, and information, such as intellectual property rights, must be associated with the digital object. Figure 2 shows that a digital object in a repository has two parts, content and associated data, sometimes called "metadata". (William Y. Arms, 1997)

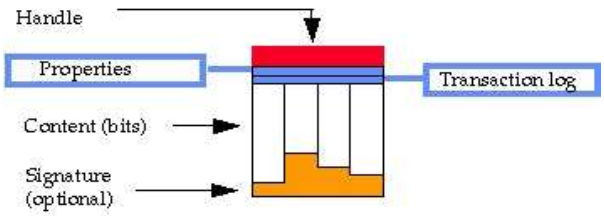


Figure 1.1 Parts of a digital object (Chooralil, 2010)

To enable the content to represent useful information, its type must be known. Thus part of the content may be of type text (perhaps encoded in a mark-up language), while another part may be of type audio. A single digital object may contain many types of content. It turns out that arbitrarily complex data types can be constructed from a few basic types, notably bit sequences, handles and other digital objects. By combining these in various combinations, any digital content can be represented.

To manage valuable intellectual property, certain metadata is required. This is shown in the figure. It always includes a unique identifier (the handle). It may also include properties such as rights and access methods. One property states whether a digital object is mutable, in that it may be altered after being placed in a repository. Another is a digital signature or other method of validating that an object has not been changed. Frequently, it is useful to keep a log of all transactions associated with each digital object.

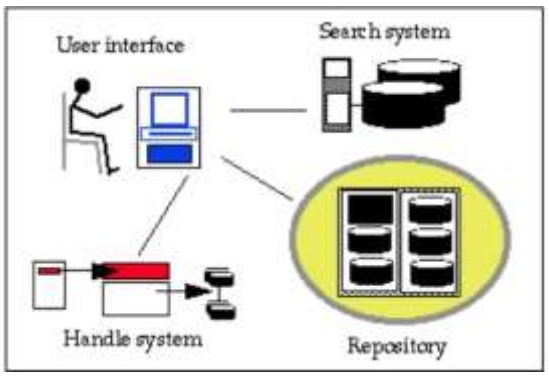


Figure 1.2 Major system components (Chooralil, 2010)

1.1.2 User interfaces

Both the pilot and the prototype have two user interfaces: one for the users of the library, the other for the librarians and system administrators who manage the collections. Each user interface is in two parts. A standard Internet browser is used for the actual interactions with the user. This can be Netscape Navigator, Microsoft's Internet Explorer, or the Grail browser developed by our colleagues at CNRI. The browser connects to client services, which provide intermediary functions between the browser and the other parts of the system. The client services allow the user to decide where to search and what to retrieve; they interpret information structured as digital objects; they negotiate terms and conditions, manage relationships between digital objects, remember the state of the interaction, and convert among the protocols used by the various parts of the system. (William Y. Arms, 1997)

1.1.3 Repository

Repositories store and manage digital objects and other information. A large digital library may have many repositories of various types, including modern repositories, legacy databases, and Web servers. We have the pilot repository that we have implemented and enhancements planned for the prototype. The interface to this repository is called the repository access protocol (RAP). Features of RAP are explicit recognition of rights and permissions that need to be satisfied before a client can access a digital object, support for a very general range of disseminations of digital objects, and an open architecture with well - defined interfaces. Repositories must look after the information they hold A repository stores digital objects, both the content and the metadata.

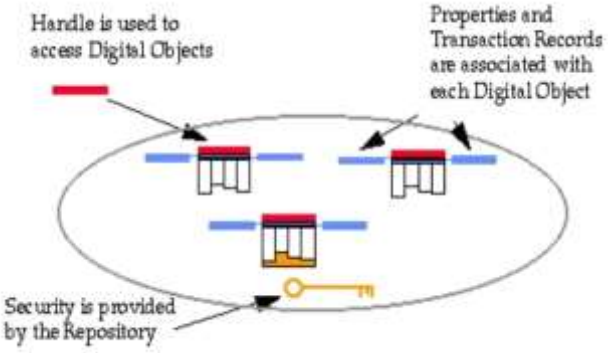


Figure 1.3. A Repository (Chooralil, 2010)

The internal organization of a repository and the way that digital objects are stored are hidden from the user. A simple protocol is provided for interactions with the repository. This protocol is called the "repository access protocol." The basic commands in this protocol are those to access a digital object and its metadata, and the service request to disseminate a digital object. In addition there are commands to add and delete digital objects.

1.1.4 Handle system

Handles are general purpose identifiers that can be used to identify Internet resources, such as digital objects, over long periods of time and to manage materials stored in any repository or database. CNRI's handle system is a computer system that provides a distributed directory service for identifiers (handles) for Internet resources. When used with the repository, the handle system receives as input a handle for a digital object and returns the identifier of the repository where the object is stored. (William Y. Arms, 1997)

1.1.5 Search system

The design of the digital library system assumes that there will be many indexes and catalogs that can be searched to discover information before retrieving it from a repository. These indexes may be independently managed and support a wide range of protocols. (William Y. Arms, 1997)

Figure 1.4: A Typical Picture of a Digital Library (Wikipedia 2014)

1.2 OBJECTIVE OF STUDY

The major objectives of these papers are as follows:

1) It will provide cutting-edges facilities and services to support research, teaching, learning, and scholarly communication across disciplines.
2) To collect, organize and collate prints and digital information and disseminate at the point of care and for future use.
3) To provide seamless access for information.

4) To act as a gateway to digital and electronic information.

5) To develop into a single access point library.

6) To develop and conduct tutorials for the users to enable them to effectively utilize the facilities and resources made available by the library.

1.3 SIGNIFICANCE OF STUDY

The relevance of this research is to attempt towards understanding the importance and benefits of digital library as individuals, in our environment and also in the society. Thus the significance are as follows:

1) To bring readers up-to-date on the progress, nature and impact of digital libraries, bridging the gap since the publication of the best-known digital library texts.
2) To provides a global perspective and integrates material from many sources in one place.

1.4 SCOPE OF STUDY

The scope of this topic covers the Historical background of Digital library, advantages and disadvantages of digital library, components of a digital library, how to use a digital library, importance of digital library to the society, the internal diagram of a digital library, characteristics of a digital library, types of digital libraries, function of a digital library, purpose of a digital library, how to create a digital library, how to add and remove an article on digital library, Types of digital libraries and examples, Software's used for developing a digital library and Hardware involved(If any)

1.5 LIMITATION OF STUDY

This research work is limited by the facts that:

1) There is lack of screening or validation

2) There is lack of preservation of a fixed copy (for the record and for duplicating scientific research)
3) There is difficulty in knowing and locating everything that is available, and differentiating valuable from useless information.
4) There is job loss for traditional publishers and librarians.

5) Costs are spread and many become hidden.

1.6 ORGANIZATION OF WORK

This research is divided into 4 chapters, which are further subdivided into sections.

Chapter one is introduction which is further divided into sub sections, they include overview, objectives of the study, significance of the study, limitation of the study, scope of the study, organization of work. Chapter two is the literature review which is divided into one section it include the historical background of the study.
Chapter three is findings. It is further divided into sub sections which include: Definition of a digital library, internal architecture of the topic, components of the study, the features and characteristics of digital libraries, advantages and disadvantages of digital library, how to create a digital libraries, how to add and remove an article from a digital library, types of digital libraries existing, Purpose and function of a digital library. Chapter four is the summary, and it is sub divided into two sections which is the conclusion and the References.

1.7 DEFINITION OF SOME TERMS

1.7.1 Library: A library is a collection of sources of information and similar resources, made accessible to a defined community for reference or borrowing.

1.7.2 Digital library: A Digital library is a focused collection of digital objects that can include text, visual material, audio material, video material, stored as electronic media formats (as opposed to print, micro form, or other media), along with means for organizing, storing, and retrieving the files and media contained in the library collection.

1.7.3 Digital objects: A digital object is a character string used to uniquely identify an object such as an electronic document.

1.7.4 Repository: Repositories store and manage digital objects and other information.

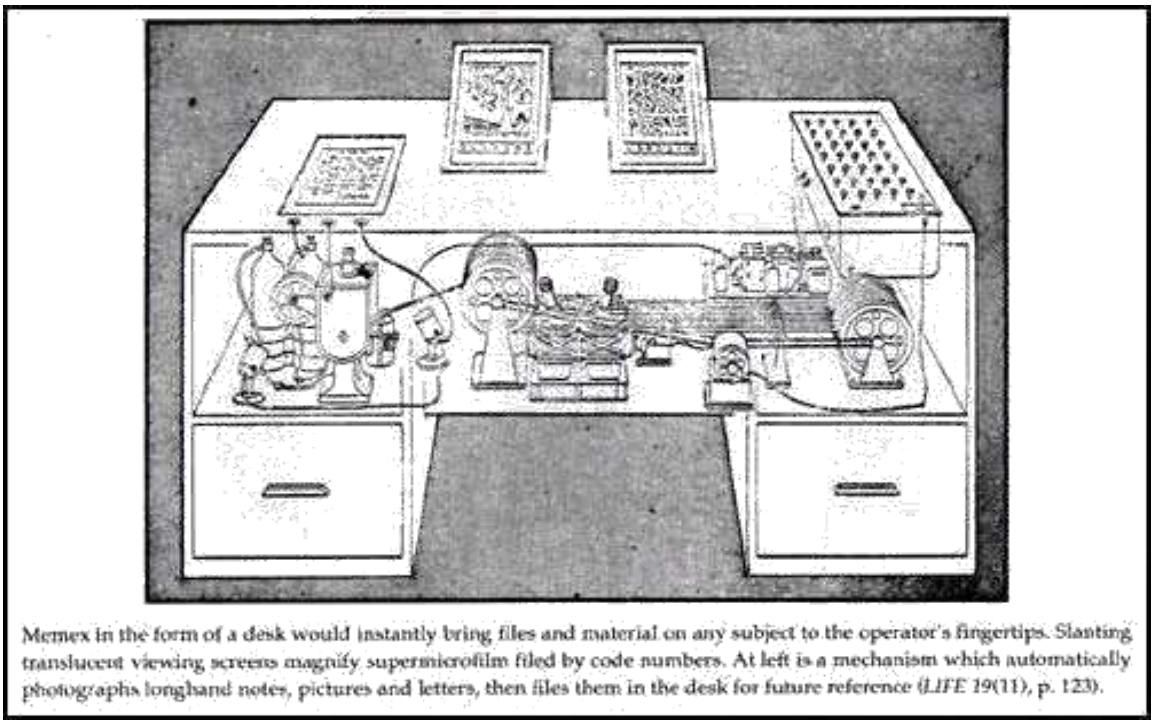
1.7.5 Metadata: Metadata is “data about data” it is defined as the data providing information about one or more aspects of the data such as: means of creation of the data, purpose of the data, Time and date of creation, creator or author of the data, Location on a computer network where the data were created.

1.7.6 Memex machine: Memex is a device in which an individual stores all his books, records and communications which is mechanized so that it may be consulted with exceeding speed and flexibility.

II. LITERATURE REVIEW

2.1 HISTORICAL BACKGROUND
The digital library concept can be traced back to the famous papers of foreseer scientists like Vannevar Bush and J.C.R. Licklider identifying and pursuing the goal of innovative technologies and approaches toward knowledge sharing as fundamental instruments for progress. Bush (Bush, 1945) devised a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility...

In 1945, Vannevar Bush had a vision. In his article, "As We May Think," he describes a technical fix for the information explosion that begun after World War II. Vannevar named this technical fix the Memex. The Memex was described as "a device in which an individual stores all his books, records and communications which is mechanized so that it may be consulted with exceeding speed and flexibility" (Bush, 1945).



Memex in the form of a desk would instantly bring files and material on any subject to the operator's fingertips. Slanting translucent viewing screens magnify supermicrofilm filed by code numbers. At left is a mechanism which automatically photographs longhand notes, pictures and letters, then files them in the desk for future reference (*LIFE* 19(11), p. 123).

Figure 2.1: A Memex machine (Khan, 2007)

2.2 RELATED LITERATURES

In 1945, Vannevar Bush had a vision. In his article, "As We May Think," he describes a technical fix for the information explosion that begun after World War II. Vannevar named this technical fix the Memex. The Memex was described as "a device in which an individual stores all his books, records and communications which is mechanized so that it may be consulted with exceeding speed and flexibility" (Bush, 1945). Vannevar was most certainly a visionary. His ideas were well before his time. His idea of the Memex can be considered the basis for digital libraries and maybe even the World Wide Web.

In the 1980s, libraries card catalogs were being replaced by Online Public Access Catalogs (OPACs). These were usually closed systems that could contain little more than bibliographic data. Most OPACs were are done in Machine Readable Cataloging (MARC) format. It generally represents an individually published item or "information product," and describes the physical characteristics of the item itself (Brenner et al, 2006).

The archival community however, no longer employs the MARC format. They use the Encoded Archival Description (EAD) format. The EAD format is better suited for encoding the hierarchical relationships between the different parts of the collection and displaying them to the user (Brenner et al, 2006). Recent trends have been capitalizing on the strengths of both formats to improve access to digital collections (AlderMan, 1998).

In the 1990s and beyond, digital libraries changed the way we have thought about how we retrieve information. What exactly is a digital library? According to Donald 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" (Waters, 1998). This definition allows for a great degree of interpretation. The concept of digital library has multiple senses that one might invoke in various contexts. For example, the concept may refer simply to the notion of collection without reference to organization, intellectual accessibility or service attributes. This extended sense seems to be in play, for example, when we hear the World Wide Web described as a digital library. The concept might also refer to the organization underlying the collection, or even more specifically to the computer-based system in which the collection resides (DLF, 1995). Digital libraries represent the meeting point of a large number of disciplines and fields, i.e., data management, information retrieval, library sciences, document management, information systems, the Web, image processing, artificial intelligence, human-computer interaction, and others (Ioannidis, 2005). The Alex Catalogue of Electronic Texts in one example of a digital library.

The Digital Library Foundation (DLF) was founded in 1995 by some of the most prominent institutions in the United States including Harvard University, Columbia University, Princeton, Yale, and the Library of Congress. In the Digital Library Foundations charter signed May 1, 1995, the foundation lists seven main goals (DLF, 1995). These seven goals are a perfect

example of the thinking required before, during, and after creating a digital library. These seven goals are the implementation of an open digital library accessible across the global internet filled with printed documents converted to digital form and incorporation of holdings already in electronic form. The establishment of a collaborative management structure for ongoing maintenance of the digital library. The development of a coordinated funding strategy from both public and private sources. The formation of selection guidelines that will ensure conformance to a theme and to ensure the digital library has a large corpus of significant materials. The involvement of leaders in government, education, and the private sector to address network issues and policy. Establishment of a comprehensive evaluation of how clients make use of the digital library for research, how that usage compares to traditional library research, and how digital libraries affect the mission, economy, and staffing of organizations and library institutions (DLF, 1995).

The Center for the Study of Digital Libraries (CSDL) was established in 1995 at Texas A&M. The center provides experience and expertise to help transfer all types of collections, from books to biological specimens, into digital libraries. The center also provides a leadership role in the online development and application of world-wide access to digital library services (CSDL, 1995). According to the Center for the Study of Digital Libraries mission statement, Digital libraries will be ubiquitous in the future and will provide the basis for a very broad set of distributed living activities including computer-supported cooperative work, distance learning, electronic commerce and entertainment. The transition to an electronic information workplace has already begun in full force. We believe that digital libraries will significantly impact the quality of education and, indeed, the quality of life over the next decade (CSDL, 1995). The CSDL has created a few notable digital library projects including George Bush Digital Library, the Cervantes Project 2001, and the TAMU Herbaria Project. One of their most interesting projects is called Walden's Paths. Walden's Paths is a K-12 education project intended to help educators organize the web for their students (Alderman, 1998).

These digital libraries do completely different things, have completely different interfaces, and use different technology to display information for their users. The Alex Catalogue of Electronic Texts has a very simple, clean layout. It also has a simple search function. There is no advanced search available with this digital library. American Memory by the Library of Congress is a little more advanced than the Alex Catalogue of Electronic Texts. American Memory has a little more complicated set up because it offers a wider variety in its collections. The Alexandria Digital Library has a much more sophisticated search function. While using their National Geospatial Digital Archive, one can search anywhere throughout the United States and recover satellite images, multiple varieties of air photos, and maps.

The University of California, Berkley started up the Cheshire II system to change their OPAC to full-text online resources. It was developed to retrieve ranked based probabilistic retrieval methods while still supporting Boolean retrieval methods. It has been constantly redesigned to meet the information retrieval needs of a broader world. Its primary usage is in full text and structured metadata collections based on SGML (Standard Generalized Markup Language) and XML (Extensible Markup Language) (Larson, 1999). The Cheshire II search engine functions as an information retrieval protocol server providing access to a set of databases (Larson, 1999). The functionality that sets the Cheshire II search engine apart from other search engines is that a natural language query can be used to retrieve the records that have the highest estimated probability of being relevant given the user's query (Larson, 1999). Any items found in a search can be selected and used as queries in a relevance feedback search.

One of the most important issues within the digital library community is conversion of paper text to a digital format. There are compelling preservation, access, and economic reasons for creating a digital master in which all significant information contained in the source document is fully represented. The most obvious argument for full-informational capture can be made in the name of preservation. Under some circumstances, the digital image can serve as a replacement for the

original. In these cases, the digital image must fully represent all significant information contained in the original as the image itself becomes the source document and must satisfy all research, legal, and fiscal requirements. If the digital image is to serve as a surrogate for the original (which can then be stored away under proper environmental controls), the image must be rich enough to reduce or eliminate users' needs to view the original (Chapman, 1996). Digital conversions should remain faithful to their respective originals. They should remain faithful because users' needs and computing capabilities vary tremendously. Also because printing, display, and image processing requirements are not all served by delivering the same image. The completeness, detail, and speed of output are often conflicting requirements within a digital conversion.

Digital libraries have distinct advantages and disadvantages over traditional libraries. Digital libraries have the potential to contain an unlimited amount of information. Traditional libraries on the other hand have to be contained in a physical space which limits the amount of information that can be held within the library. In the same idea, a traditional library's physical space makes it difficult for people far away to access the library's collection. A digital library can be accessed from all around the world. Traditional libraries have hours of operation. When the library is closed, you cannot access the information. A digital library can be accessed at any time. When someone takes out a piece of a traditional library's collection, no one else can use it. Any piece of a digital library can be accessed by numerous people at the exact same time.

Digital libraries have had their share of critics. Digital libraries can have issues with copyright and copyright law. These concerns can be avoided by working around the problem by using public domain content only. Another way around copyright law is by licensing content and distributing it on a commercial basis. A big criticism of digital libraries is that many can only be accessed by certain audiences. For example, many digital libraries force you to pay to access their collections. The only people that usually get to access these collections are in an academic setting. Many people who could gain a lot from access to such information will never get the chance. Many argue that digital libraries could mean the end of the printed book.

Digital libraries will continue to grow and grow but will not completely replace the printed book. According to Walt Crawford, books are comfortable, portable, reliable, and economical means of providing large amounts of information in compact form (Crawford, 1998). Crawford gives a very strong argument on why traditional libraries will continue to be viable even with the proliferation of digital libraries.

III. RESEARCH FINDINGS

3.1 MODE OF OPERATION OF A DIGITAL LIBRARY

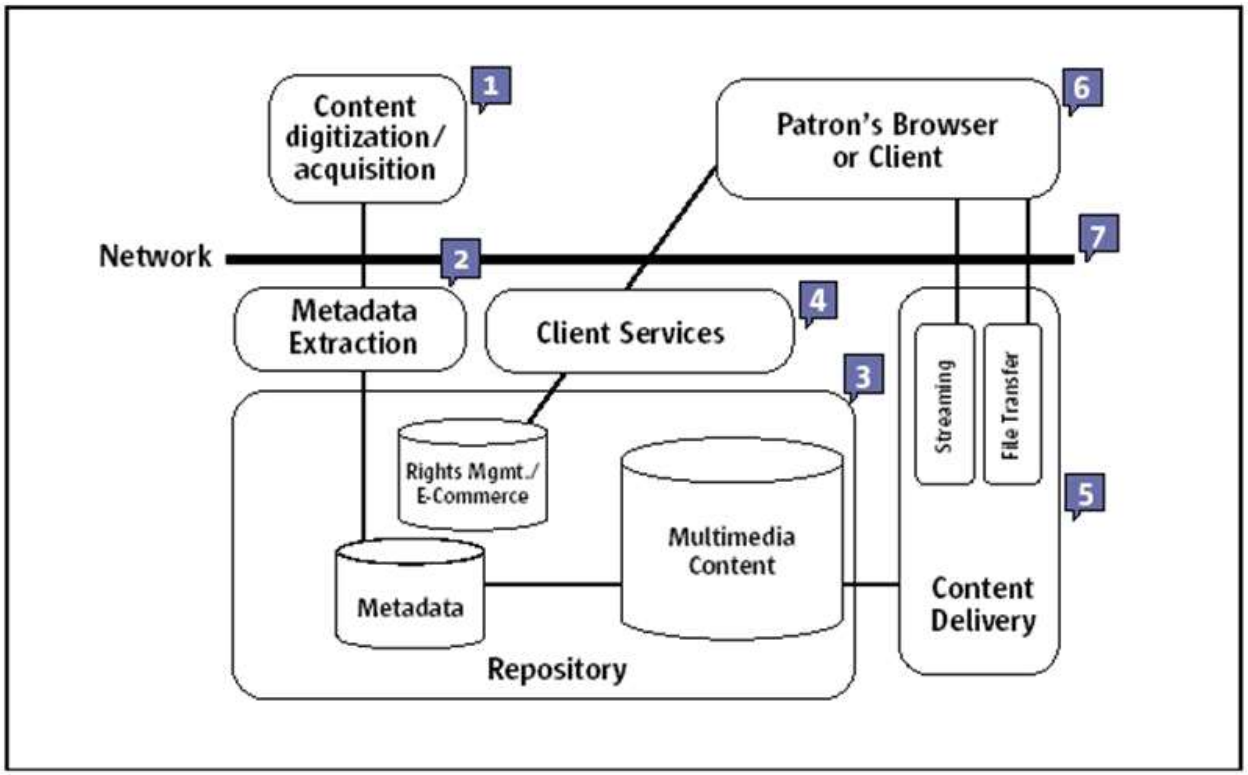


Figure 3.1: Mode of operation of a digital library (Eskinder Asmelash PPT, 2010)

1. Initial conversion of content from physical to digital form.
2. The extraction or creation of metadata or indexing information describing the content to facilitate searching and discovery, as well as administrative and structural metadata to assist in object viewing, management, and preservation.
3. Storage of digital content and metadata in an appropriate multimedia repository.

The repository will include rights management capabilities to enforce intellectual property rights, if required. E-commerce functionality may also be present if needed to handle accounting and billing.

4. Client services for the browser, including repository querying and workflow
5. Content delivery via file transfer or streaming media
6. Patron access through a browser or dedicated client
7. A private or public network.

3.2 ARCHITECTURE OF DIGITAL LIBRARY

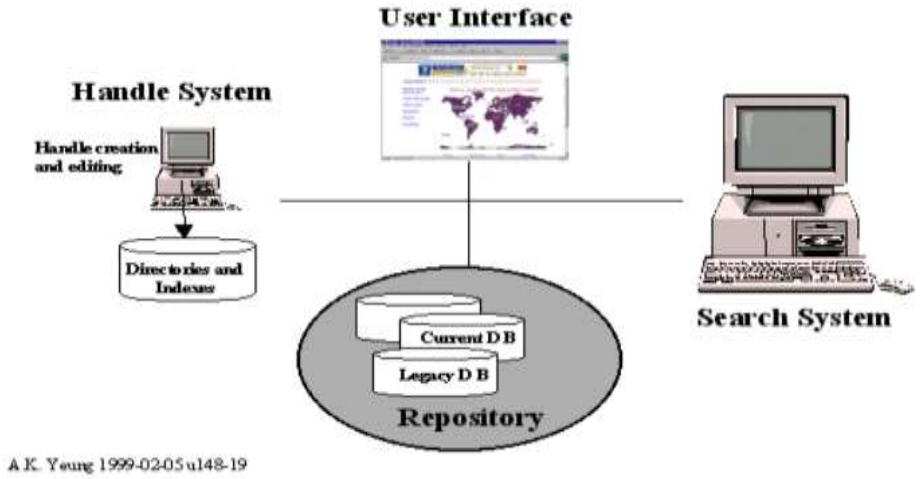


Figure 3.2: Architecture of an Ideal Digital Library (A.K. Yeung, 1999)

3.3 TYPES OF DIGITAL LIBRARY AND EXAMPLES

3.3.1 Stand-alone Digital Library (SDL)

This is the regular classical library implemented in a fully computerized fashion. SDL is simply a library in which the holdings are digital (i.e., electronic –scanned or digitized). The SDL is self-contained –the material is localized and centralized. In fact, it is a computerized instance of the classical library with the benefits of computerization. Examples of SDLs are the Library of Congress (LC) and its National Digital Library (NDL) (http://www.loc.gov), and the Israeli K12 Portal Snunit (http://www.snunit.k12.il).

3.3.2 Federated Digital Library (FDL)

This is a federation of several independent SDLs in the network, organized around a common theme, and coupled together on the network. A FDL composes several autonomous SDLs that form a networked library with a transparent user interface. The different SDLs are hetero and are connected via communication networks. The major challenge in the construction and maintenance of a FDL is interoperability (since the different repositories use different metadata formats and standards). Examples of FDLs are the Networked Computer Science Technical Reference Library (NCSTRL) (http://www.ncstrl.org) and Networked Digital Library of Theses and Dissertations (NDLTD) (http://www.ndltd.org).

3.3.3 Harvested Digital Library (HDL)

This is a virtual library providing summarized access to related material scattered over the network. A HDL holds only metadata with pointers to the holdings that are "one click away" in Cyberspace. The material held in the libraries is harvested (converted into summaries) according to the definition of an Information Specialist (IS). However, a HDL has regular DL characteristics, it is finely grained and subject focused. It has rich library services, and has high quality control preserved by the IS, who is also responsible for annotating the objects in the library. The HDL harvesting model is further detailed in section 3. Examples of HDLs are the Internet Public Library (IPL) (http://www.ipl.org/) and the Virtual Library (http://www.vlib.org/).

EXAMPLES OF SOME DIGITAL LIBRARIES AND HOW TO ACCESS THEM.

1) LOC - Library of Congress American Memory (http://memory.loc.gov/ammem/)
2) NSDL - National Science DL (http://nsdl.org)
3) IPL - Internet Public Library (http://www.ipl.org)
4) CDL - California DL (http://www.cdlib.org)
5) ADL – Alexandria DL (http://www.alexandria.ucsb.edu)
6) BL - British Library (http://www.bl.uk/)
7) NZDL – New Zealand DL (http://www.nzdl.org/)
8) Einstein Archives Online (http://www.alberteinstein.info/)
9) IEEE Digital library – (www.ieeedl.com)
10) ACM Digital library – (www.acmdl.org)
11) Networked Digital Library of Theses and Dissertations (NDLTD)-(http://www.ndltd.org).
12) ArticleCentral.com! (http://www.articlecentral.com/)

13) Networked Computer Science Technical Reference Library (NCSTRL) - (http://www.ncstrl.org)
14) Israeli K12 Portal Snunit (http://www.snunit.k12.il).

3.4 SOFTWARES INVOLVED

There are different software's used in digital library such as:

3.4.1 **Alfresco (software):-Alfresco** is a free/libre enterprise content management system for Microsoft Windows and Unix-like operating systems. It is used for Enterprise content management for documents, web, records, images, and collaborative content development.

3.4.2 **Cambridge imaging system: -** It was founded in 1996, is a software company based near Cambridge, UK that specializes in enterprise video platforms. It has one subsidiary company, Screenocean, based in London, UK, an online digital library containing program material and related metadata from the Channel 4 archive.

3.4.3 **Digital Commons: - Digital Commons** is a hosted open access institutional repository and publishing solution, combining traditional institutional repository functionality with tools for peer-reviewed journal publishing, conference management, and multimedia.

3.4.4 **DSpace: - DSpace** is an open source repository software package typically used for creating open access repositories for scholarly and/or published digital content. While DSpace shares some feature overlap with content management systems and document management systems, the DSpace repository software serves a specific need as a digital archives system, focused on the long-term storage, access and preservation of digital content.

3.4.5 **EXo-Platform: - eXo Platform** is an open source, standard-based, Enterprise Social Platform written in Java and distributed under the GNU Lesser General Public License. The platform is sold and distributed by eXo Inc., a global company with U.S. headquarters in San Francisco, California, global headquarters in France, and offices in Tunisia and Vietnam.

3.4.7 **Fedora Commons: - Fedora** (or **Flexible Extensible Digital Object Repository Architecture**) is a digital asset management (DAM) architecture upon which institutional repositories, digital archives, and digital library systems might be built. Fedora is the underlying architecture for a digital repository, and is not a complete management, indexing, discovery, and delivery application. It is a modular architecture built on the principle that interoperability and extensibility are best achieved by the integration of data, interfaces, and mechanisms (i.e., executable programs) as clearly defined modules.

3.4.8 **Greenstone (Software): - Greenstone** is a suite of software tools for building and distributing digital library collections on the Internet or CD-ROM. It is open-source, multilingual software, issued under the terms of the GNU General Public License. Greenstone is produced by the New Zealand Digital Library Project at the University of Waikato, and has been developed and distributed in cooperation with UNESCO and the Human Info NGO in Belgium.

3.4.9 **Intra-text: - IntraText** is a digital library that offers an interface while meeting formal requirements. Texts are displayed in a hypertextual way, based on a Tablet PC interface. By linking words in the text, it provides Concordances, word lists, statistics and links to cited works. Most content is available under a Creative Commons license it also offers publishing services that enable similar advantages. The IntraText interface applies a cognitive ergonomics model based on lexical hypertext and on the Tablet PC or touch screen interface. It uses a set of tools and methods based on HLT (Human Language Technologies). IntraText is a reading, reference and search tool. It can be used to read a work, to browse a text as hypertext, to search for words and phrases just through a simple click of your pen or mouse.

3.4.10 **Invenio: - Invenio** is an open source software package that provides the tools for management of digital assets in an institutional repository. The software is typically used for open access repositories for scholarly and/or published digital content and as a digital library. Invenio is developed by the CERN Document Server Software

Consortium, and is freely available for download. Free and paid support models are available. The service provider TIND Technologies was established in 2013 to accommodate the growing demand for support of Invenio.

3.4.11 **Islandora: - Islandora** is an open source digital repository system based on Fedora Commons, Drupal and a host of additional applications. It is open source software (released under the GNU General Public License) and was developed at the University of Prince Edward Island by the Robertson Library. Islandora may be used to create large, searchable collections of digital assets of any type and is domain-agnostic in terms of the type of content it can steward. It has a highly modular architecture with a number of key features

3.4.12 **Knowledge Tree: - Knowledge Tree, Inc.** provides online software that helps sales and marketing teams discover, manage, and refine the collateral they use in sales engagements. The technology is tuned for sales, sales operations, and marketing teams. Based in Raleigh, North Carolina, the company also has an office in Cape Town, South Africa.

The company's product, also called Knowledge Tree, makes use of the Amazon EC2 cloud computing platform and Salesforce.com's Force.com platform. Knowledge Tree's features — including content discovery, reporting, and editing — are designed to support B2B sales situations that depend on collateral and documents. The service is available on a subscription basis.

3.4.13 Pleade: - Pleade is an open source search engine and browser for archival finding aids encoded in EAD (an XML standard for encoding archival finding aids). Based on the SDX platform, it is a very flexible web application.

3.4.14 SABDA: - SABDA or **SABDA Bible Software** is an Indonesian integrated Bible study

platform that's based on the Online Bible engine, [1] with multilingual Bibles available in the program (including Indonesian, Malay, English, Greek and Hebrew, and many local languages of Indonesia). The word *sabda* is the Indonesian word for Logos (via Sanskrit: *shabda*), and also abbreviation of "Software Alkitab, Biblika Dan Alat-alat" (Bible Software, Biblical Resources, And Tools). It is produced and managed by Yayasan Lembaga SABDA (SABDA Foundation) which translated and made available freely more than 100 Biblical modules in Indonesian since 1994, besides the default OLB modules.

3.5 HARDWARE INVOLVED

The hardware's involved are as follows:

1) Computer, mobile phone or any device that can access the network.
2) Storage device or Database where data and information are kept and stored
3) Scanner that will be used to convert traditional object into Digitized objects.
4) Printer will be used to print out digitized object.
5) Internet Modem which will be used to access the network.
6) Traditional Materials Such as books, magazines e.tc.

3.6 IMPORTANCE OF DIGITAL LIBRARY

1) **Scholarly communication, education, research** such asE-journals, e-books, and data sets, e-learning.
2) **Access to cultural collections** such as Cultural heritage, historical & special collections, museums, biodiversity.
3) **E-governance** such as Improved access to government policies, plans, procedures, rules and regulations
4) Archiving and preservation.

3.7 ADVANTAGES OF DIGITAL LIBRARY

1) **No physical boundary**. The user of a digital library need not to go to the library physically; people from all over the world can gain access to the same information, as long as an Internet connection is available.
2) **Round the clock availability** a major advantage of digital libraries is that people can gain access 24/7 to the information.
3) **Multiple access**. The same resources can be used simultaneously by a number of institutions and patrons. This may not be the case for copyrighted material: a library may have a license for "lending out" only one copy at a time; this is achieved with a system of digital rights management where a resource can become inaccessible after expiration of the lending period or after the lender chooses to make it inaccessible (equivalent to returning the resource).
4) **Information retrieval**. The user is able to use any search term (word, phrase, title, name, and subject) to search the entire collection. Digital libraries can provide very user-friendly interfaces, giving click able access to its resources.
5) **Preservation and conservation**. Digitization is not a long-term preservation solution for physical collections, but does succeed in providing access copies for materials that would otherwise fall to degradation from repeated use.
6) **Space**. Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them and media storage technologies are more affordable than ever before.
7) **Added value**. Certain characteristics of objects, primarily the quality of images, may be improved. Digitization can enhance legibility and remove visible flaws such as stains and discoloration.[14]
8) Easily accessible.

3.8 DISADVANTAGES OF DIGITAL LIBRARY

Digital libraries, or at least their digital collections, unfortunately also have brought their own problems and challenges in areas such as:

1) **Equity of access** – the digital divide.
2) **Interoperability** between systems and software.

3) **User authentication** for access to collections.
4) **Information organization**.

3.9 ***Interface design***.

3.10 APPLICATION AREAS

It can be applied in different areas, places, organizations and institutions. These include:-

1) Schools.
2) Banks.
3) Business organizations.
4) Economics.
5) Hospitals.

IV. CONCLUSION

There will be continuing expansion of digital library activities. Digital libraries will build upon work being done in the information and data management area. Digital libraries provide an effective means to distribute learning resources to students and other users. Planning a digital library requires thoughtful analysis of the organization and its users, and an acknowledgement of the cost and the need for infrastructure and ongoing maintenance (Adams, Jansen, and Smith 1999).

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