

Digital Library: Processes, Services, Challenges and Opportunities

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Abstract: If technology push, crashing costs, and global connectivity are the signposts for the coming decade, digital libraries are the next step in the convergence revolution. Digital libraries are innovations, the implementation of which is nascent in the developing countries. However, they hold the promise of becoming key technologies for knowledge creation and management in the future. The purpose of this article is to describe basic concepts, processes and services of digital libraries, discuss challenges and opportunities offered/faced by digital libraries.

1. Introduction

Today's changing and extremely advancing technological environment requires everything to be advanced. To cope with this type of environment every field is supposed to accept the fact and implement new emerging technology in it. So is the case of Libraries. A digitally advanced library provides every possible requirement of its technically advanced users. A digital Library (DL) wider the area and scope of library, it will enhance the library facility. DL will have no boundaries of time, space, geographical area, and racial discrimination between people for accessing the information. One can access the Digital Library from a remote area or from some other country also and at a very cheaper rate. Accessing a digital library will allow one for quick, cheap and easy information.

A Digital Library will give traditional library a reform that will increase library visits by the users providing their information in digital form at computers. Today DL had improve the library services like electronic journal support service, Electronic Document Delivery, Electronic Publishing, Resource Service, Inter Library Loan, full text searching, cross-searching specialist abstracting and

indexing databases etc. for learning and teaching. All the information is stored on the computer that will be connected to a personal computer through a network making this period of time as a memorable time in the history of libraries.

2. Digital Library:

According to Lesk (1997)

"Digital libraries are organized collections of digital information. They combine the structuring and gathering of information, which libraries and archives have always done, with the digital representation that computers have made possible."

According to Digital Libraries Federation (DLF) (1999)

"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."

According to - William Arms

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

According to Gladney H.M, et. al. (1994)

"A digital library service is an assemblage of digital computing, storage, and communications machinery together with the software needed to reproduce, emulate, and extend the services provided by conventional libraries based on paper and other material means of collecting, storing, cataloguing, finding, and disseminating information."

3. DL Services:

Digital Library Services provides a wide array of services to assist members of the library with organizing collections of materials or making them more widely available. the following services offered by the Digital Libraries.

- Catalogue Databases,
- Current Awareness Bulletins,
- Externally Purchased Databases,

- CD-ROM Databases,
- Remote Information Services,
- Internally Published Newsletters, Reports & Journals,
- Internet Information Sources Mirroring & Cataloguing,
- E-mail,
- Bulletin Board Service,
- Netnews system,
- Audio and Video Communication,
- Electronic Table of Contents,
- Electronic Document Delivery Service,
- Electronic Theses and Dissertations,
- Reference Service,
- Electronic Publishing,
- Discussion groups and forums
- Central storage facilities for Hosting digital collections and indexes
- Tools for loading, storing, searching, and displaying digital objects
- Special Collections service

4. Digital Library Processes

4.1. Content selection:

The content selection for the DL is depends on the utility, value and rarity of collection. It may be Internal or external, free or commercial, owned or licensed, print or electronic formats. The content may includes Staff publications, e-mail archive, news, reports, policies and plan documents, drawings, software, press releases, presentations, courseware, lectures, best practices, etc. for education and corporate purpose.

4.2. Content acquisition

Digital Library acquired contents already in digital form as well as to be converted and they may be loaded in central or distributed sites. The format (PDF, TIFF, postscript, html, xml) of the digital content may selected as those supported subsequent presentations today & tomorrow and It should not needs special access mechanism.

4.3. Content organization:

The concept of content management has been around in intellectual organization and physical organization. Intellectual organization consist object description, categorization, indexing control and automatic content extraction. Physical organization includes databases, indexes, storage, content granularity (full text tagging or hierarchical browsing support), search and retrieval. Digital object identity fire also paying important role in content organization. The content organization needs special attention in DL because it is the base of the DL services and products.

4.4. Content access and delivery

DL is changing landscape for access and delivery of digital contents globally. This allows various type search such as Structured search (metadata-driven), Object search (full-text, multi-media object search), Search at finer granularity (tables, figures, paragraphs, section headings), Global search and resource type search (e.g. bibliographic databases, e-journals, reports, experts). The searching features includes Relevance ranking, Search refinement, search history, search set combination, Personalization, customization. It also facilitates structured presentation (display), Hierarchical browsing (subject schemes/ topic directory). Access and delivery area of Digital library are developing new innovative technologies and processes in these areas that will capitalize upon the digitized status of DL content, and allow quicker, easier and cheaper access to content, which in turn will be a powerful justification for your digitization effort. Access and delivery process are aided by conversion to digital mass storage.

4.5. Access management

Access management consist various operations such as access control, content security, object identification, ownership establishment, License metering, user Id and password management, Proxy/IP authentication management, etc. All the above operations have been controlled by the various software's and techniques which facilitate to DL has access control over the owned and licensed contents.

4.6. Usage and monitory:

DL have integrated usage and monitory system that gives answers of such question like what digital sources are being used, how much and by whom. Those answers may help you to evaluate system performance and information services.

4.7. Networking and interoperation

Networking enhances digital information services and resource sharing. Metadata and Open access initiative allows federated access to different collection within and across DL. Interoperation allows to DL users to find out desired information from different system across the word.

4.8. Preservation:

Digital preservation involves quite different methods, skills, and outcomes and can complement traditional preservation services, while simultaneously providing unique and dynamic new uses of information. Digital Library ensures perpetuity and long-term access through time and changing technologies.

5. Challenges:

5.1. Economical

There is always a cost in its creation, its production, and its dissemination. Digital libraries introduce new and uncertain economic realities and relationships into libraries. Where the costs of accessing information were once hidden to patrons, the digital era is likely to require customers who will be required to pay fees for access to digital services and collections. The major obstacle is digitization. Digitization is very cost intensive. Especially when one goes single handed toward digitization. For digitization to succeed in the developing countries, the socio-economic conditions have to strong to a digital library.

5.2. Technological obsolescence

The digital storage media such as hard disk, tapes and floppy disk have a very short life—span due to rapid technology obsolescence. The computer hardware and software which used for storage and retrieval become obsolete and they are replaced by batter technologies.

5.3. Administrative

For building and working with Digital Library the long-term organizational, fiscal, and institutional commitments will be necessary. Management of the technical infrastructure for "digital library" services will be a significant obstacle for most libraries, especially as budgets continue to shrink and the costs of developing and maintaining collections increases. Administration of the digital collections locally, is harder and more expensive than managing a comparable print collection.

5.4. Copyright:

Copyright is one of the obstacles in the plans to create extensive digital collections. Copyright protects the owner's creative or intellectual work. Digital collections and services will be strongly affected by future copyright and licensing regimes, as well as prohibitive costs for digitization and Support of technical infrastructure. Copyright could become an insurmountable barrier to the development of digital collections. In fact, copyright could end up preventing libraries from providing open access to the digital information they collect.

5.5. Lack of expertise:

Digital library are considered by many to be a challenging area. The development of an infrastructure for the networked resource discovery and

retrieval of highly distributed, autonomously created, and diverse electronic information is required. Above all, this infrastructure will need to be managed by professionals who understand information needs and uses.

6. Opportunities:

6.1. Expand services

DL is added to expand the repertoire of the Pre-existing library services or complementary to existing one. It is also creating new services for a new or changing market. DL has seamless provision of services that are responsive to the needs and interests of the communities served. It is clear that the DL is maintaining an acceptable level of operational service. Effective authentication is the key to delivery of personalized services. There are significant opportunities for products and services emerging from digital libraries to expand their markets beyond the boundaries of the time and geographical location to achieve additional wider benefits.

6.2. Promote Collections

Promoting of more widespread use of unique collections is one common aim of DL. Collection is one of rare and expensive materials in library. It includes collections created as digital (i.e. e-books, e-journals, e-databases) or digitized rare books, manuscript, pictures and fragile material. Digitization of collection is depending on the utility, rarity and value. Since the digitization is the major expensive process, it should be done by the expert because it may be painstaking and therefore mindful of the preservation and security needs of the collection. The digital collection has grater visibility and global accessibility with features of searching, browsing and cross-reference linking.

6.3. Knowledge management/ content management

Digital library has wider prospective working towards manage and access of work practices, internal information assets and intellectual assets which are to improve the creativity of the persons, sharing of knowledge and to achieve the objectives of an organization.

6.4. Scholarly communication

Digital Libraries support in scholarly communication in the field of education, research and development through the E-journals, e-prints, e-books, data sets, e-learning and e-transformation.

6.5. Archiving and preservation

It allows archiving and preserving documents/ digital objects of education, Cultural, heritage, historical & special, museums and biodiversity for long term

continued accessibility of the document contents through time and changing technology and reproduce a suitable facsimile of the original document.

6.6. E-governance

Digital libraries offer the improved access to govt. policies, plans, procedures, rules and regulations so that the general people of the country can access important information on their desktop. It fulfills the needs of right to information act. E-governance also helps to manage various activities related to Government and peoples.

6.7. Generate revenue

DL can sell of the information services for the internal and external users of various organizations. It can provide consultancy services and advertising facility for the creation of revenue.

7. Conclusion:

Although this perspective of the "digital library" is predictable because of existing library models, there remains an anachronistic quality to it. Regarding the costs, technologies, legal issues and administration of "digital libraries" militate against achieving this old paradigm vision.

Given that the digital library field is still quite new, it seems strange to be talking already about enhancing digital libraries. However, in this fast-moving environment, the initial digital libraries resulting from digitization projects, or even virtual collections, are being enhanced as user expectations and technology capabilities allow. In the midst of this furious activity, it is valuable to analyze users' needs and interests and then to identify Knowledge Organization System that can be used to enhance the digital library. By going beyond the initial organization of the digital library, digital librarians can use the network environment to provide additional value to its users.

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