DIGITAL LIBRARY: A NEW WAY OF CONTENT MANAGEMENT SYSTEM

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ABSTRACT

Digital Libraries are emerging technologies for document management. These documents includes multimedia objects. It requires new methods of all aspects of multimedia data management. Starting from the source through storage to delivery. Digital libraries have to use all modern network and servers technologies in order to supply services of a high quality. This paper describes the Digital Library Content Management System (DLCMS) a general purpose software component tailored to support design and effective implementation of digital library applications. DLCMS is flexible in the management of documents containing different types of data and content descriptions; it is efficient and scalable in the storage and content based retrieval of these documents. The perspectives of digital library involves the full potential of digital electronics technology in which users enable seamless and open access to all types of information without limits to format or geography of the system A digital library is a library in which collections are stored in digital formats accessible by computers. The digital content may be stored locally with remote access and computer net work facilities. Digital library system confirm its success only with users cooperation and partnership among cultural institutions. This paper elucidates the functions of digital library content management system. Also, various technical considerations associated

with Digital content developments related activities in which the digital library plans to engage with the digital preservation.

Keyword: Digital Library, Content Management System, Digital Library Content Management System,Digital Library System

INTRODUCTION

The term digital library has been subject of a certain confusion concerning its interpretation and use. Sometime it has been used to refer the accessible digital content of a library. Sometime it has been used to indicate a specific application built to make accessible a specific digital content. Sometime it has been related to a set of software tools that can be used to build a digital library application, in order to access a published digital content. However, we may observe that in the digital library field we may use the same distinction that is made in the database systems field between the database, which is the set of data that should be managed, the database management system, which is the general purpose software specialized in data management, and the database application, which is the application which allows users to access data. Thus, in the following we will distinguish between the Digital Library, which is the set of documents – or, more in general, the set of digital objects – that are managed, the Content Management System (CMS), which is a general purpose software module that can be customized in order to provide different functionality in the management of digital objects, and the Digital Library Application (DLA), which is a specific application to access the digital objects belonging to a particular Digital Library.

Digital library emphasis on access to digitized materials wherever they may be located, with digitization eliminating the need to own or store a physical item and cataloging down to individual words or graphs. Browsing based on hyperlinks, keyword, or any defined measure of relatedness; materials on the same subject do not need to be near one another in any physical sense The availability of the Internet brings dramatic changes to millions of

people in terms of sample collection and organization of various inputs. It will help to disseminate, access, and use relevant information. The principle of a digital library involved different things distributed textbased information system or a networked multimedia information system; to end users. The Objectives of digital library involved single entity, technology to link the resources, universal access . Digital library collections are not limited to document surrogates: they extend to digital artifacts that cannot be represented or distributed in printed formats. Also, the usability of digital libraries in order to evaluate the full potential of digital libraries. The main drawbacks are many unanswered questions related to whether users use them, how they use them, and what facilitate and hinder their access of information in these digital libraries. These drawbacks can easily be eliminated by making proper changes in the existing digital library system.

Digital Library

- Collection of Documents with some value for a longer period
- Documents have to be described by metadata
- Citation should be possible for a longer period
- Versioning should be possible, but documents are not updated
- One can sell, buy, own Documents

Digital Library System

- Software for Creation, Publication, Describing, Storing, Distribution, Search, Publication, Usage, Archiving Digital Library Content
- Distributed system (worldwide)
- Authors, Providers (Publishers), Mediators or Broker (Libraries), Readers
- Artists, Music Labels, CD Shops, Music Fans

Not only scientific literature as applications

- Office documents, videos, mp3-files, signed applications in E-Government, old maps, ..

Usage Scenarios for Digital Library

A digital library system was designed as the framework for several multimedia service scenarios, which will be realized within it. The main topics addressed in this area are:

- The management of different types of data including stream based data,
- The creation of multimedia publications,
- The storing of documents and objects contained in these documents,
- The possibility of describing objects and documents by simple metadata for searching,
- Access control for content.

Web Content Management System(WCMS) is a software system that provides website authoring, collaboration, and administration tools designed to allow users with little knowledge of web programming languages or markup languages to create and manage website content with relative ease. A robust WCMS provides the foundation for collaboration, offering users the ability to manage documents and output for multiple author editing and participation.

Most systems use a content repository or a database to store page content, metadata, and other information assets that might be needed by the system. A presentation layer (template engine) displays the content to website visitors based on a set of templates, which are sometimes XSLT files. Most systems use server side caching to improve performance. This works best when the WCMS is not changed often but visits happen regularly.

Administration is also typically done through browser-based interfaces, but some systems require the use of a fat client. A WCMS allows non-technical users to make changes to a website with little training. A WCMS typically requires a systems administrator and/or a web developer to set up and add features, but it is primarily a website *maintenance* tool for non-technical staff.
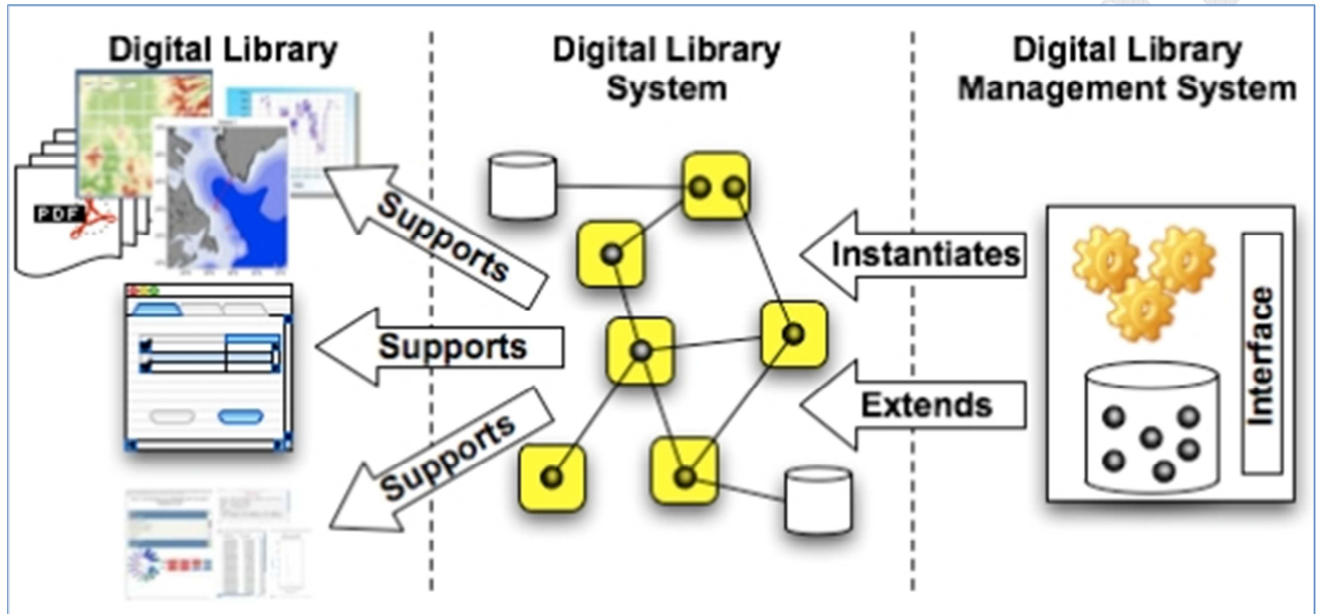
DIGITAL LIBRARY APPLICATIONS

Usually a DLA offers most of the services provided by a traditional library, which mainly consist of three aspects: (i) library creation, which includes all techniques needed to build the library and index the documents, (ii) library exploration, which includes all techniques used to enable users to select the relevant documents and to visualize them, (iii) library management, which includes all techniques used to support the management of the library in terms of access control, security management, billing, etc

There is a broad consensus that only 10 to 15% of the corporate information is today managed, quite effectively, by database management systems. The rest of this information, like office documents, legal papers, technical references, regulations, marketing material, customer relationship information, etc. should be in the scope of the Content Management System (CMS). In order to effectively manage this kind of data, a CMS should be able to manage not only formatted data, like in databases, but also textual data, using Information Retrieval technology, semi-structured data, typically in XML (W3C standard), mixedmode data, like structured presentations, and multimedia data, like image and audio/video.

These kinds of requirements are especially essential for the next generation Digital Library Applications (DLA). Accessing multimedia data is becoming more and more essential for digital libraries since numeric data and text documents account for only 0.003% of the total amount of digital information produced today. Today, there is an extensive

research work towards the extension of DL technology to support the management of other media: images, audio, video, etc. At the same time, the first multimedia DLAs are becoming commercially available. In general, the services offered by a multimedia DLA are similar to the services offered by a textual DLA.

Existing Digital Library Applications just require documents to be inserted and metadata to be generated before being ready to be operative for document searching and retrieving. Furthermore, the digital library technology is today limited to manage specific types of digital objects and specific metadata description models. This implies that existing DL Applications can be hardly adapted to different application environments and to different metadata description models. Indeed, many DLAs were built having in mind a specific application and, in many cases, a specific document collection. Thus, the result is an ad-hoc solution where all components of the DLA (the data repository, the metadata manager, the search and retrieval components, etc.) are specific to a given application and cannot be easily used in other environments.

Digital library applications often offer predefined workflows, metadata schemes, and document formats, that cannot be changed to be adapted to specific application scenarios and end-user requirements and no customizations can be performed for adapting the user interface to the specific scenarios. Many of these systems guarantee inter-operability with other systems, by adopting standard protocols such as OAI, or Z39.50

Users of library were very positive about the potential of using online resources from digital libraries in their classroom. Despite the potential for a ceiling effect in comparison with the post-workshop survey, results show that the workshop still managed to have a generally positive impact on teachers' knowledge level, attitudes, and subsequent behaviors. A major challenge for digital library evaluation is to identify what to evaluate and how to evaluate non intrusively at low cost.

Digital library evaluation is a challenging task due to the complicated technology, rich content and a variety of users involved. The most recognized digital library evaluation criteria are derived from evaluation criteria for traditional libraries. Review usability tests in selected academic digital libraries found that ease of use, satisfaction, efficiency and effectiveness are the main applied criteria. Some of the evaluation studies extend to assess performance, content and services of digital libraries while service evaluation mainly concentrates on digital reference.

Other evaluation studies also look into the impact of digital libraries. Evaluation of digital libraries based on the research made by the users, in particular, their criteria and their actual assessment of digital libraries with respect to evaluation criteria. Also actual studies are conducted to evaluate existing digital libraries or prototypes of digital libraries. There is a lack of user input regarding evaluation criteria. User evaluation of digital libraries by applying their own criteria is needed. The remaining questions related to digital library evaluation are: the relationship between users' use and evaluation of digital libraries and the

relationship between users' perceived digital library evaluation criteria and their actual evaluation.

Electronic journals service of the digital library is another area for evaluation. In these studies, the evaluation emphasizes more on characteristics of users and their usage patterns related to preferred databases, preferred electronic journals, and their frequency of use[8]. Interaction between users and digital libraries is also an important component for evaluation. Researches in digital library identified the key attributes of interactivities: reciprocity, feedback, immediacy, relevancy, synchronicity, choice, immersion, play, flow, multidimensionality. Interactivities in a digital library includes the aspects of resources, resources selection, description of interactivities in metadata, and interactivities in interface. It also highlights the importance of the evaluation on interactivity that enhances learning.

DIGITAL LIBRARY CONTENT MANAGEMENT SYSTEM

The important parameters of digital library content management systems are

- **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.

- **Round the clock availability -** A major advantage of digital libraries is that people can gain access 24/7 to the information.

- **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).

- **Information retrieval -** The user is able to use any search term (word, phrase, title, name, subject) to search the entire collection. Digital libraries can provide very user-friendly interfaces, giving clickable access to its resources.

- **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. Digitized collections and born-digital objects pose many preservation and conservation concerns that analog materials do not. Please see the following "Problems" section of this page for examples.

- **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.

- **Added value and easily accessible -** 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.

DIGITAL LIBRARY TECHNOLOGY SERVICES

Note that many digital library projects have mainly aimed at defining general purpose services that should be provided by a digital library. Typical services are for example, repository services, collection services, authentication services, etc. However these definitions were limited to a very high abstraction level. Very little effort has been devoted to define and investigate specific solutions for efficiently realizing these services, or to investigate the existence of technologies, proposed in other fields, that can be used to cope with these issues. In addition, sometime these digital library services were defined as a consequence of requirements of specific digital library applications, while their generality, innovation, and real importance to generic digital libraries was never proved. For example,

while it is clear that any digital library should have a repository service that manages documents and/or metadata storage. It is not also obvious that all digital library applications really need complex custom user authentication/authorization services, which can be anyhow obtained relying upon services offered either by employed operating systems, application servers, or even database systems.

The potential of digital library technology enables information with one dimension representing the level in which users and tasks are well known in advance. The other dimension representing the level in which the data has a known and well defined structure. Also, it is possible to distinguish the characteristics of Digital Library applications from typical Web and database applications: Typical Web search engines assume very little about users, tasks, and the data they deal with. Consequently, they occupy a relatively small part of the space. On the other hand, database applications have strong assumptions about users, tasks, and data. The typical interaction with database management systems is usually limited to a few transaction types to be performed very efficiently and data must be specified in advance, using relational schemas. Hence, these applications occupy a small part of the space as well. Digital library evaluation can also reveal the factors affecting users' acceptance. The assessment of digital library identify the determinants of user acceptance of digital libraries, and among them, perceived usefulness and ease of use are the major ones which are predicted by interface characteristics such as terminology clarity, screen design and navigation clarity, organizational context relevance and system visibility. Also, individual differences like computer self-efficacy, computer experience, and domain knowledge. Finally digital library evaluation extends to the impact of digital libraries derived from usage analysis of log data. Also, current studies in on line computer system in libraries evaluated the impact of a digital collection and characterized the user community of a specific digital mode of collection of books, and they further identified research trends in user communities of digital libraries over time.

DIGITALIZATION PROCESS AND PATHWAYS

Data storage and retrieval is the first and foremost consideration of a digitalized research process. As this discussion of digital convergence involves multimedia, we need a means to store and retrieve text, audio, video and graphics files. Almost all CAQDAS (Computer Assisted Qualitative Data Analysis Software) applications on the market are varieties of customized database solutions. Librarians have considerable experience in digitization, although the profession has tended to call it something else. The retrospective conversion of printed library cards into machine-readable catalog records represents one of the earliest widespread, digitization efforts. The cost/benefit analysis to librarians and users for enhanced bibliographic access established the benefit of the expense, but it was acknowledged that the costs involved were higher than anticipated. Sampling is one of the category involved in digital library. Recruitment of the sampling system include subjects need to understand digital libraries and have some experience with the use of digital libraries.

Also, these subjects are the targeted audience for similar types of digital libraries. Subjects with similar characteristics. Data collection involved multiple methods which are employed in collecting data, diary, questionnaire, and survey. It consists of browsing, searching and help mechanisms at the general level as well as at the individual collection level. Digital Collections is created based on the teaching and research needs of the all demands. It does not have much general level of search, browsing and help mechanisms, but it does have these mechanisms at individual collection level. At the same time, the subjects were asked to record their search process in their diaries including: 1) time used (by minutes), 2) the whole search process (any queries used, any categories browsed, any help used, and any problems encountered), and 3) The answers to each of the questions. The subjects work on the digital libraries at any locations that they feel comfortable. Second, they were instructed to rate the importance of the digital library evaluation criteria in a close

ended questionnaire and add new ones if needed. Questionnaire was designed based on a set of essential criteria for the evaluation of digital libraries developed and justified by number of subjects. The subjects of this study also confirm their choices of criteria that they consider extremely important for the evaluation of digital libraries. Third, they were instructed to apply the evaluation criteria that they identified as important to evaluate the two digital libraries that they have searched information in the first step.

CONCLUSIONS

The digital librarian will become the guardian of digital information and will be the vehicle to preserve democratic access to information. The digital librarian's role will be increasingly towards offering consultancy to the users in their efforts in providing digital reference services, electronic information services, navigating, searching and retrieval of digitized information through Web documents that span the Universal Digital Library or the Global Digital Library. The digital libraries are used effectively and with ease. Both quantitative and qualitative methods were used to analyze the data.

Quantitative methods were employed to conduct descriptive data analysis, such as frequency and mean. Content analysis is applied to develop categories and subcategories of evaluation criteria, and categories and subcategories of positive and negative aspects of digital libraries. Also, categorical distinctions define units by their membership in a category by having some common parameters. In this study, each category and subcategory of the positive and negative aspects of digital libraries is defined and discussed by citing responses directly from the participants. The data analysis procedures contain each subject and each question, identify time used, initial queries used, paths in browse, levels in browse, queries in browse, help used and types of problems encountered. Also, digital library system used to calculate the average time used, number of initial queries used, number of paths in browse, number of levels in browse, number of queries in browse, and number of times help used. The perception of Digital library involved the questionnaire; and their choices of important

or extremely important criteria. All the responses that shared the same properties were classified into one category. Excellent procedures may followed for the analysis of the justification of important or extremely important and successful digital library evaluation criteria.

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