DEFINING THE BOUNDARIES OF DIGITAL LIBRARIES: A REVIEW

F.R. Sumer
Central Library, North-Eastern Hill University, Shillong, Meghalaya, India

P. Hangsing
Dept. of Library and Information Science, North-Eastern Hill University, Shillong, India

A.R.D. Prasad
Documentation Research and Training Centre, Indian Statistical Institute, Bangalore, India

ABSTRACT

In an academic environment, the term “Digital Library” is used apparently in two dimensions. While researchers view digital libraries as content collected on behalf of user communities, librarians view them as institutions or services. There is an increase input in the research-oriented definitions on digital libraries which serve to stimulate researchers focus their attention on issues that needs to be address which have expanded considerably throughout the late 1990s. On the other hand definitions pertaining to the library community highlight the practical challenges that need to be addressed in the process of transformation of research libraries and universities. However, there exists a certain level of uncertainty while using the term “Digital Library” or digital libraries when viewed from these two domains. While this state of ambivalence further stimulates the rapid advancement of research however it may impede implementation of digital libraries. Further, broad array of digital library definitions and assumed statements also focus on technology, content, collection and communities, institutions or services relevant to this aspect and in accordance to a specific purpose for a particular digital library. However, review indicates that lately general elements which are common to all definitions of the digital library were clearly identified with a vision for the future which stirs up a sense of assurance to both researchers and librarians alike.


1. INTRODUCTION
The proliferation of Information and Communication Technology (ICT), along with the enormous influence that the Internet have on the lives of potential library users had coerced many traditional libraries to actively take up digital library projects. Research grants have further increase digital libraries research and practice worldwide in the early 2000’s. However, since the initial years of its introduction, the term “Digital Library” is used in two distinct senses. In general, researchers view digital libraries as content collected on behalf of user communities while librarians view them as institutions or services. Research-oriented definitions served to build a community of researchers focusing its attention on problems to be addressed which too have expanded considerably in scope throughout the 1990s. Library community definitions are more recent and served to focus attention on practical challenges to be addressed in the transformation of research libraries and universities. Future trend points towards the need for extensive research in digital libraries and for the transformation of libraries as institutions. However, the uncertainty in the use of the term “Digital Library” or digital libraries is hindering the advance of research and practical application in digital libraries as in “[1]”.

2. DEFINITIONS OF DIGITAL LIBRARIES
A digital library is organised manifestations of university library material whose objective is to assist users locate required information. Its aim is to also extend services similar to what a traditional library would do using ICT tools as in “[2]”.

Some definitions of the digital library that focus mainly on the technology are viz. A digital library enables users to interact effectively with information distributed across a network as in “[3]”. Digital libraries are systems that collaborate readers, authors, librarians and researchers with digital content with human intervention with support of computer-based tools and knowledge as in “[4]”. Digital library is a collection of digital objects, including text, video, and audio, along with methods for access and retrieval, and for selection, organization and maintenance of the collection as in “[5]”.

According to “[1]”,

Digital libraries are a set of electronic resources with technical features enabling the creation, retrieval and the use of information.

Digital libraries are built with the sole purpose to be used by members of a community in order to meet their respective objectives. They are a vital entity which enables interested users to communicate on a computer network. Thus, they are an extension of physical libraries, museums, archives where organised resources are made accessible for an intended community of users.

As in “[6]”, a digital library is simply “a collection of information which is both digitized and organized.” As in “[7]”, it summarizes broad array of digital library definitions into the following three elements.
- some sense of a collection, with some kind of organization; the content may be partly physical and partly electronic, or entirely electronic;
- a collection that is not entirely bibliographic or exclusively a set of pointers to other material, it must contain some full-form online material and may be in a variety of formats;
- a goal exists to link “audience, group, patron, or community with attributes of the collection”, whether in the manner that physical collections are selected for a specific audience or in the sense of the virtual space that be created around the community.
As in “[8]”, digital libraries “provide personalized or custom services for accessing, assembling and analyzing information resources from a variety of diverse sources in many different formats.”

3. DIGITAL LIBRARIES AS CONTENT, COLLECTION AND SERVICES

Digital library is a service, architecture, a set of information resources, databases of text, numbers, graphics, sound, video, etc and a set of tools and capabilities to locate, retrieve and utilize the information resources available. Users of a digital library would include students, teachers/professors, researchers/scholars, librarians, authors, publishers, information providers and practitioners. Contributors of information resources would include publishers, universities, professional societies, libraries, authors, editors and compilers. Thus the list is very comprehensive since it includes services, architecture, content, enabling technologies, users and content as in “[1]”. National Science Foundation (1993)* states that “Information sources accessed via the Internet are the ingredients of a digital library”.

4. DIGITAL LIBRARIES AS INSTITUTION AND SERVICES

As in “[9]”, it was prophetic in noting that the term ‘digital library’ is problematic because it hides the understanding of connection between electronic information collections and libraries as institutions. As in “[10]”, it was commented that the two words “digital” and “library” in the term ‘digital library’ contradict each other. As in “[11]”, there was a strong opinion on dismissing the idea in using the term ‘digital library’ since it is “dangerously misleading”.

The Digital Library Federation (DLF)* definition of "digital library" does more than simply enumerate features. It serves in addition as the basis for the DLF's perspective on the scope of digital libraries and on the functional requirements for their development. This is a full definition by any measure and a good working definition because it is broad enough to comprehend other uses of the term. Those other definitions focus on one or more of the features included in the DLF definition, while ignoring or de-emphasizing the rest as in “[12]”.

As in “[13]”, it was assumed that the three characteristics of digital libraries are as follows:

- digital library collections contain secured and lasting documents;
- digital libraries are based on digital technologies;
- digital libraries are to be used by an individual.

As in “[14]”, the three general principles guiding the British Library’s digital library programme are as follows:

- the digital collection may be created and produced in a variety of different places, but will be accessible as if it were a single entity;
- the digital collection will be organised/categorised/indexed for easier access than is possible from its original point of production;
- the digital collection will be stored and maintained in such a way as to ensure that it will continue to be available long after the period of its immediate currency.

Notes*

5. STATEMENTS ON DIGITAL LIBRARIES
Digital libraries creators have characterized statements according to purpose for particular
digital libraries. Though these are not definitions by themselves but are assumed statements
which bear significance on how such libraries are regarded by their creators over the years.
They comprised of a set of twenty assumptions which are group into four categories viz.
basics; content; services and use; and research and evaluation. These are presented as follows:

5.1. Basics
- There is (or will be) such a thing as a digital library.
- Most, if not all, libraries will progress steadily to a ‘fully digital’ state over time as in “[15]”. Most, if not all, libraries will remain indefinitely in a 'hybrid' state, with digital and non-digital resources offered side-by-side as in “[16]”.
- Implementation of the digital library concept implies organisation and cultural change.
- The digital library builds upon the traditional strengths of the library/information professions.
- The digital library is a catalyst for the development of the library/information professions in entirely new ways. The digital library marks the end for the traditional library/information professional.

5.2. Content
- Digital libraries will contain material in digital form.
- A digital library will have an identifiable collection.
- Digital libraries will contain documents.
- There will be a continued emphasis on text in digital libraries.
- The contents of digital libraries will result from a publication process.
- Digital libraries will be concerned with preservation of material.

5.3. Services and use
- Digital libraries will be used in much the same way as traditional libraries.
- A digital library will include an equivalent of the traditional catalogue.
- A digital library will provide a range of searching and browsing tools
- Digital libraries will provide integrated services, ideally approaching ‘seamless’ integration.
- Digital libraries will offer customised interfaces for particular users.
- Digital libraries will act as gateways or portals.
- Digital libraries will support the analysis and processing of information.
- Digital libraries will promote information literacy as in “[17]”.

5.4. Research and evaluation
- It is possible to do research on digital libraries.
- It is possible to evaluate the effectiveness of digital libraries.

In a 1995 statement, the United States Association of Research Libraries noted that there
are many definitions of a digital library, and that the terms ‘virtual library’ and ‘electronic
library’ are often used synonymously. The five general elements common to all definitions of the digital library current in the first half of the decade are identified as follows:

- the digital library do not exist independently;
- the digital library depend on technology to network resources and libraries;
- the network between digital libraries and information services is transparent when viewed from users point of view;
- primary goal of digital libraries are for universal access;
- digital library handled collections not confined to documents having equivalent content in print but also extends to non-print material.

The notion of the library as a space is better agreed upon than the notion of the library as an information repository as in “[18]”. Though digital libraries are in fact better regarded as socio-technical systems, As in “[19]”, it was pointed out that rather than looking at the digital library as a specific technology, it could be also be placed in the context of a specific learning and teaching environment based on an organisational approach. After a decade of messianic expressions like ‘Electronic Library’ and ‘Digital Library’, which seemingly imply there is no longer a place for books, the term ‘Hybrid Library’ can be seen as evidence of a refreshing, new realism’ as in “[20]”.

We think it best to consider a digital library to be a library/information service, located either in a physical or virtual space, or a combination of both, in which a significant proportion of the re-sources available to users of that service exist only in digital form. The electronic library is a term which has had a longer usage in the literature than ‘digital library’, and is usually associated with a somewhat old-fashioned approach. It generally indicates a rather limited approach to the digital library, simply indicating the provision of a range of material in digitised form, within the framework of traditional library provision.

The hybrid library is generally taken as lying somewhere on a continuum from the traditional to the digital library, with electronic and paper-based sources used alongside one another. A hybrid, or gateway, library provides an environment and services that are partly physical and partly virtual. The term virtual library has been used at times, though with little consistency in meaning; it is often used to describe collections of web resources. Library of the future seems to be a catch-all term, while library without walls has sometimes been used to refer, not only to digital collections, but also to outreach programmes with physical material. None of these terms seems particularly useful. The term digital library has been used, to usually carry two particular connotations: a greater degree of digitisation, i.e. a greater reliance on digital sources, and a greater ambition and scope.

The clustering for ‘digital library’ shows the greatest richness of concepts. The general digital library cluster is complemented by concepts of retrieval, publishing and subject access, metadata, repositories, educational applications, and research projects. ‘Electronic library’ shows a somewhat more ‘old fashioned’ picture, with concepts of libraries, and rather traditional looking processes and resources, as well as rather dated Internet tools. ‘Hybrid library’ shows an overlap with the semantically unrelated idea of libraries of hybrid organisms in genetics; apart from this, it shows a concern for the processes of digitization and the subsequent preservation of material above general ‘electronic library’ issues.

A digital library collection, which, as noted above, may be logically defined as a set of criteria for selecting resources from a broader information space, may be less formally understood as a set of digital objects, with the following characteristics:

- coherence: there is some theme to the set, it is not a random grouping;
Defining the Boundaries of Digital Libraries: A Review

- significance: it is useful enough in sum to be worth regarding as a collection;
- control: the objects are prepared and organised according to some standards, and are preserved in some way;
- access: there must be means of access to the objects, usually both by description and subject.

In a traditional library, the collection is defined by physical presence and by ownership. In the digital library, it must be defined by access, technical and economic since the items comprising the collection will not be physically present, and will mostly be licensed rather than owned outright. Upon closer examination, we find that the term ‘digital library' has multiple meanings. These definitions cluster around two themes and are formulated to serve specific purposes. From a research community's perspective, digital libraries are content collected and organized on behalf of user communities. Its focus is to identify and address research problems thereby expanding the community of interest around these problems. From a library practice community's perspective, digital libraries are institutions or organizations that provide information services in digital forms with a focus on practical challenges involved to transform library institutions and services as in “[1]”.

A successful digital library needs to possess unique characteristics in order to be able to adapt to change over a long period of time. Such a requirement, usually are influences that tend to satisfy a user’s needs viz. Extending a new service through a feature on the graphical interface or establishing digital libraries as network of Open Archives as hypothesized by the Open Digital Library (ODL) project as in “[21]”.

6. EXPECTATIONS FROM DIGITAL LIBRARIES

While understanding modern concepts on this aspect will go a long way to prepare digital libraries relevant in the future however at this juncture these stimulating domains seems rather not useful to the general users in particular. The term ‘digital library' has been lingering for quite some time creating an aura whereby there is a greater dependence on digital content with an ambitious intention. The assemblage of digital libraries projects richness of concepts however to a librarian concern for the processes of digitization and preservation of materials far outweigh the general digital library issues. In a traditional library, the collection is defined by physical presence and by ownership. In the digital library, it must be defined by access, technical and economics since the items comprising the collection will not be physically present, and will mostly be licensed rather owned outright. From a research community's perspective, digital libraries are content collected and organized on behalf of user communities. Its focus is to identify and addressed research problems thereby expanding the community of interest around these problems. From a practicing librarian perspective, digital libraries are institutions or organizations that provide information services in digital form with a focus on practical challenges involved to transform library services and the institution as a whole. As in “[22]”, a given digital library system should provide a coherent, consistent view of as many of these digital repositories as possible so that from the user's perspective, to the extent possible, they should appear to be a single digital library system. To system designers, librarians and users, Digital Libraries of the future should cater to a diverse set of users. Under these circumstances, collaborating with all potential contributors will establish a sustainable development including their further development. Digital libraries (DLs) should be presented with a multilingual interface in order to enable users to communicate with the language of their choice in order to retrieve relevant information instantly. On this aspect, as in ‘[23]”, adopting the concept of crowdsourcing is highly desired to address issues online when delivering information in the multilingual mode as adopted by Facebook and Wikipaedia. However, it needs to be establish through research on whether interactive
multilingual digital libraries will be popular since they are meant to achieve scholarly objectives. This is due to the fact that as in “[24]”, users prime objective are not that much inclined to dwell on the fact that they are to express a sense of co-operation including the ability to communicate with other DL users. While the feature to record a user profile on Dls is preferred mostly by new users, however, the presence of an online help feature is least important suggestions amongst all category of users. What user needs from a Digital Library is quick access to information from a diverse pool of knowledge whose subject coverage knows no bound. Thus Digital Library designers and Librarians alike have to focus upon user’s priorities while developing the features and content of a Digital Library to ensure its success.

7. CONCLUSION
The varied dimensions that the term “Digital Library” emanates in general will remain for some time. Researchers, librarians, system designers and users however have distinct clarity on the characteristics that a digital library should exhibit. To a librarian, the technologies that drive the change, inevitably, focus on modern digital libraries as virtual spaces which facilitate an effective learning and teaching environment. However, from an academic administration point of view what will have a more meaningful impact is when a digital library is able to meet the organization objectives. In general, it is perceived that Digital Libraries comprises of content, services and technology all amalgamated as a single entity to ensure that users can effectively use it with ease and pleasure with least limitation and barrier. Librarians need to think beyond the limited approach to the digital library as simply the provision of a range of material in digitized form, within the framework of traditional library system. The path into the future envision the fact that digital libraries will prevail in an era of the semantic web in view of the fact that metadata are embedded in its architecture with inherent characteristics to support faceted knowledge characteristics a concept which is unavailable in most resources in the World Wide Web today. What can be most satisfying to Librarians is that fact that Digital Libraries in the semantic web can mimic the features and function of traditional libraries relevant to its users as in “[25]”. What is more appropriate is to strive ahead in order to reap the benefit that digital libraries can offer in order to transform library and institutions through the specialized services they offer. However, defining the boundaries and characteristics of these varying information spaces and exploring ways in which they can be merged into a coherent whole is a crux of the entire matter which needs to be addressed.

REFERENCES
Defining the Boundaries of Digital Libraries: A Review


