



Challenges to Preservation and Building Digital Libraries in India

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Abstract- *India is a developing country, which has to grow more in the field of agriculture, education and technology. It is very important now to compromise us with the third world in other fields also. Communication is one among the basic for development and digitization is the terminal point of it. Digitization in the field of education, particularly in digitizing books and study materials is the latest need around the world and India will also to join in this stream modernization. Professor Harlan Cleveland, an eminent scholar in the field of ICT has given his thought to the implications of the ICT revolution that Information symbols, not things will be playing the lead role in world history that physical labour, stone bronze, land minerals, metals and energy once played. We will have to burn into our consciousness how very different information is from all its predecessors as civilization's dominant resource. A digital library goes far beyond an electronic version of a traditional library. Digital libraries should be multifunctional, diversified, and readily accessible to all types of users. In the future digital libraries should be able to help people transform information to knowledge by effective digital information acquisition, organization, retrieval and dissemination. Some of the current trends leading to future plans for digital libraries are discussed in this paper*

Keywords— *Digital Library, Ebook, Print Process, Protocol, Digital Collection*

I. Introduction

The term *digital library* is diffuse enough to be applied to a wide range of collections and organizations, but, to be considered a digital library, an online collection of information must be managed by and made accessible to a community of users. The term Digital Library has a variety of potential meanings, ranging from a digitized collection of material that one might find in a traditional library through to the collection of all digital information along with the services that make that information useful to all possible users. As there are many definitions of a “digital library,” terms such as “electronic library” and “virtual library” are often used synonymously. A digital library is nothing but a large database for the people who are working on hypertext environment. It is an environment, which supports the full life cycle of creation, storage, preservation, dissemination and use of data, information and knowledge.

According to Arms a digital library is a managed collection of information with associated services where the information is stored in digital format and accessible over a network. The digital library federation in the USA defines the digital library as: 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. A digital library is an organized collection of digitized material or its holding in the digital form, which can be accessible by a computer on the network by using TCP/IP or other protocol.

The Digital Library is: [31-32]

1. Organized collection of multimedia and other types of resources.
2. Resources are available in computer process able form.
3. The function of acquisition, storage, preservation, retrieval is carried out through the use of digital technology.
4. Access to the entire collection is globally available directly or indirectly across a network.
5. Support users in dealing with information objects
6. Helps in the organization and presentation of the above objects via electronic/digital means etc.

Time is a major factor for each modern user of the library and digitization is the only solution to the problem. Digital libraries are needed to provide quality-based service at the user doorstep. In general digital libraries are needed for the following reason.

- 1. Easy to understand:** The visual or graphical information system of digital libraries is more popular as compared to text based information system.
- 2. Shifting of the environment:** The new generation user becomes only happy when they will be able to read from the computer screen.

3. Multiple function of same information: In case of digital libraries by using hypertext it is possible to structure and organized the same digital information in a variety of ways, which serve multiple functions.

4. Information explosion: Digital library is expected to be able to handle the problem of information explosion somehow. It will be able to handle and manage large amount of digital content by simply providing link, without actually procuring the document.

5. Information retrieval: By using digital library one will be able to retrieved information specifically for e.g. A particular image, photo, a definition etc.

6. Distance learning: Learning from home, office or other places, which are convenient to user.

7. To procure online publication: More and more information are going to published over internet, digital library is needed to procure the online publication and to provide link to important sources of information.

II. The process of Digitization

Digitization is the process of representing an object, an image, or a signal (usually an analog signal) by a discrete set of its points or samples. The result is called "digital representation" or, more specifically, a "digital image", for the object, and "digital form", for the signal.

Analog signals are continuously variable, both in the number of possible values of the signal at a given time, as well as in the number of points in the signal in a given period of time. However, digital signals are discrete in both of those respects, and so a digitization can only ever be an approximation of the signal it represents. The digital representation does not necessarily lose information in this transformation since the analog signal usually contains both information and noise.

A digital signal may be represented by a sequence of integers. Digitization is performed by reading an analog signal A, and, at regular time intervals (sampling frequency), representing the value of A at that point by an integer. Each such reading is called a sample.

A series of integers can be transformed back into an analog signal that approximates the original analog signal. Such a transformation is called DA conversion. There are two factors determining how close such an approximation to an analog signal A a digitization D can be, namely the sampling rate and the number of bits used to represent the integers. In the past few years, procedures for digitizing books at high speed and comparatively low cost have improved considerably with the result that it is now possible to plan the digitization of millions of books per year for creating digital libraries.

Myth 1[6]: The Internet is the digital library.

A global information network, of which the Internet is the seed, has the illusion of promising fingertip access to the world's information. A fairly spectacular example of what many people consider to be a digital library today is the World Wide Web. The Web is a gathering of thousands and thousands of documents. Many would call this huge collection of documents a "digital library" because they can read and use whatever they wish by accessing the Web, just as one can use technology to do banking in a "digital bank" or buy compact discs in a "digital record store".

Myth 2[6]: The myth of a single digital library or one-window view of digital library collections.

the digital future will be an unruly one composed of multiplicity of competing information providers. Libraries will be only one source of information. "Prime" information resources will probably be locked into proprietary collections essentially "private digital libraries" which are accessible on a subscription or pay-per use basis. Developing interoperability standards for locating and retrieving information in this highly distributed and heterogeneous environment will be a considerable challenge in their own right.

Myth 3[3]: Digital libraries will provide more equitable access, anywhere, any time.

A great deal of work must be done to turn this myth into reality. We can assume that a global computer network □ the Internet or some descendant □ will be the primary delivery mechanism for digital information.

Myth 4[3]: Digital libraries will be cheaper than print libraries.

A common assumption among technology reporters about the costs of "digital libraries" is that digital is cheaper than paper. This contention is far from established in fact or in practice. Although many libraries project savings, especially when substitution strategies are used which replace selected serials titles with document delivery services, the cost/benefit analysis of making this switch remains unclear. In some cases, the switch to electronic serials may save the library money by offsetting the cost to users who must pick up the charge for document delivery.

Digital information is, and will be, treated differently than paper-based information. It is likely that in the near future, the terms of accessibility and the conditions for management and collection of electronic information will not be determined by the library profession within the context of traditional library services, but rather by information professionals working to maximize return on a corporate information resource. Making the distinction between "public digital libraries" and "private digital libraries" will become an increasingly important consideration. In the view of some librarians, a "digital library" should do all the things that traditional libraries have done for hundreds of years, and play the same essential role in society that libraries have always played. Accordingly, a true "digital library" will build on the central library ethic: it would exist as a sustainable information commons that supports open access to a wide variety of material expressing diverse viewpoints. The only difference is that a "digital library" operates in an electronic medium. In this view, a "digital library" should include a collection of digital objects, but it would encompass much more than such a collection. A "digital library" would also include all the processes and services^¾collection development and management, subject analysis, index creation, reference work, and preservation^¾that are the backbone and nervous system of contemporary libraries. These are the processes and services that are invisible in a well-run library, and thus are taken for granted. Although this perspective of the "digital library" is predictable because of existing library models, there remains an anachronistic quality to it. As suggested above, the costs, technologies, legal issues and administration of "digital libraries" militate against achieving this old paradigm vision. One important consequence of the information revolution is that the costs of organizing information are beginning to match the costs of producing the information.

III. The World eBook Library

1. The World eBook Library would like to support your library to succeed in meeting the eBook demands of your Users.
2. The World eBook Library can help your library to create a unified approach delivering eBooks for curriculum content while exciting the reader.
3. World eBook Library, a leading innovator in the development and distribution of digital resources, would like to help in this collaboration by offering a subscription to the world's largest PDF eBook and eDocument collection for only \$2 per student per year.
4. With over 400,000 eBooks in collection, membership provides an easy way to build and enhance the current library collections.
5. All the materials and resources are available to all students 24 hours a day, 365 days a year. Unlike other library subscription services, the World eBook Library allows your users to access the digital collection from off campus locations (WeL DOES NOT restrict IP access).

Books online

The World eBook Library focuses on building collections for users of all ages. In our library you will find classic adventure/ghost stories such as Mary Wollstonecraft Shelley's *Frankenstein*, Henry James' *Turn of the Screw*, Washington Irving's *The Legend of Sleepy Hollow*, Louis Stevenson's *Treasure Island*, Dr. Jekyll and Mr. Hyde, Frank Baum's *The Wonderful Wizard of Oz* and *The Magic of Oz*. The World eBook Library Consortia Collection shelves more than 400,000 PDF eBooks in 100+ languages. The World eBook Library contains 125 of the finest eBook and eDocument collections published on the Internet today.

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- Enough for several Lifetime's Worth of Reading.

The Digital Library: Setting out the Challenges

Creating "effective" digital libraries poses serious challenges for existing and future technologies. The integration of digital media into traditional collections will not be straightforward, like previous new media (e.g., video audio tapes), because of the unique nature of digital information [2-3]it is less fixed, easily copied, and remotely accessible by multiple users simultaneously. Traditional library processes such as collection development and reference, though forming a potential basis for "digital library" work, will have to be revised and enhanced to accommodate these differences. Taking what we know about libraries as a starting point, we can begin to examine in more detail what the specific challenges might be.

Resource Discovery

Digital information on the Internet is characterized by the fact that digital documents can exist in several formats, possibly in several versions, in locations that are not yet fixed. A document or resource may exist at one network location one day, and disappear the next. Services such as AltaVista, YAHOO, and other WWW services are increasingly popular. These indexing services provide an essential service in assisting users to find information. But users are already noting that these services are becoming overburdened and that obtaining meaningful results can be frustratingly elusive.

Digital Collection Development

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. What was learned in the process? One lesson is surely that conversion of paper into digital is expensive and time-consuming. 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.

Some types of media reveal themselves to be more suited to digitization than others. Photographic collections, bibliographic resources, statistical collection, and even some kinds of journal literature are amenable to digitization. Other materials such as maps and books may be less amenable to digitization. Considerable study of what users need, how they use information, and whether digital formats serve their needs effectively is still required. Undertaking large digitization initiatives without a fundamental understanding of user needs is putting the cart before donkey. Being digital is not necessarily commensurate with being useable. In an era of difficult to obtain resources, questioning the efficacy of undertaking the expensive process of digitizing specialized collections of materials that may support a handful of scholars is not only legitimate but essential. It is possible that some digitization efforts will create collections of what is essentially, dead digital information—information with low market value, of limited interest and utility, and whose circulation is no greater than its paper or microfilm equivalent. It may be that most of the important information that the poor in any country need may not be in databases. Librarians collect published information in a variety of formats—books, journals, CDROMs, audio and video tapes and discs. To this growing set of media, libraries are adding repositories of digital information, on-line databases of documents and images in various formats. It will not generally be the case that libraries will *replace* older media with digital media, but that they will collect them *in addition to* established media. The reasons this substitution will not easily occur are many: user resistance, limitations on use, poor digital product design, or the medium may not be effective to satisfy the user requirements. The challenge here will be to “span both print and digital materials... [and to] ...provide a coherent view of a very large collection of information.” [Lynch 95]

Preservation

If we assume that libraries are able to build and/or acquire some types of digital collections, there remains a significant challenge inherent in preserving these collections. Pre-digital libraries have had to worry about climate control and the de-acidification of books, but the preservation of digital information will make these time-consuming and costly problems look easy. For example, digital storage media are "fragile", with a limited shelf life. Worse yet, the digital information on those storage media, even if they do survive will be rendered unreadable by obsolescence of technology—the fact that as information technology evolves, older systems disappear taking with them the ability to read the information they managed. To preserve digital information, digital libraries will continually have to “migrate” information from one digital hardware and software configuration to another. The Report of the Task Force on Archiving of Digital Information suggests that "rapid changes in the means of recording information, in the formats for storage, and in the technologies for use threaten to render the life of information in the digital age as, to borrow a phrase from *The Digital Library: Myths and Challenges*.

Challenges

Hobbes, 'nasty, brutish and short.'" [TFADI 96] The cost of such migration is unknown and there is no guarantee that future generations will have the funds to do this. The digital preservation function must be attended to in all digital collections. Even libraries, which do not normally have a significant preservation concern, will find that digital collections will require "refreshing" and migration to new systems to maintain their accessibility. Technological obsolescence, migration of digital information, legal and organizational issues all test the "limits of digital technology." There are no preservation standards for digital information. In the pre-digital world, libraries have had a long-standing tradition of resource sharing. This resource sharing takes the form of reciprocal borrowing privileges, coordinated collection development, preservation programs, shared cataloguing, and union lists of serials. It has been carried out through many associations, consortia, cooperative projects, and other formal and informal resource sharing agreements.

No single library can take upon the responsibility of "doing it all". The same resource-sharing will be necessary in the coming digital era. For example, in the United States, libraries have begun to create strategies for sharing digital information. The U.S. National Digital Library Federation, made up of the largest American research libraries and archives and the Commission on Preservation and Access are working to develop a coordinated funding strategy and formulate selection guidelines to collect electronic information in the US. Without such arrangements, there will be no one to ensure that the terabytes of digital information that will be scattered about the network will be collected, ordered and preserved. In Canada, the Data Liberation Initiative is an co-operative effort by Canadian universities to increase access to Canadian statistical databases through common licensing and access arrangements.

Librarians argue that if we do not emphasize the *library* in the phrase "digital library" and build collections that can be preserved, then future generations will look back at this time as a digital Dark Ages □ a time when, somehow, the record of human knowledge went missing. In the final report of the Task Force on Archiving of Digital Information, the first of the general conclusions was that "the first line of defense against the loss of valuable information rests with the creators, providers and owners of digital information." [TFADI 96]

Digital Library Administration

Peter Graham of the Rutgers University Libraries, suggests that for implementation of a Digital Research Library, long-term organizational, fiscal, and institutional commitments will be necessary. The technical tasks are "the easiest to solve; they will only cost money" □ it is the institutional commitments that "will be much more difficult to achieve." [Graham 95] The TULIP final report provides supporting evidence of the importance of this commitment: *Politics, lack of priority and lack of responsibilities can cause long delays and have all but killed the [TULIP] project in a few of the TULIP universities.*

Management of the technical infrastructure for "digital library" services will be a significant hurdle for most libraries, especially as budgets continue to shrink and the costs of developing and maintaining collections increases. The recently released final report of TULIP (The University Licensing Program), a major project between Elsevier Science and 9 leading American universities to test systems for the networked delivery of electronic publications, concluded that "managing large digital collections locally, is harder and more expensive than managing a comparable print collection." [TULIP 95].

Copyright and Licensing

If libraries do begin to systematically collect digital information on a larger scale, the provision of effective access could be questionable. In fact, copyright could end up preventing libraries from providing open access to the digital information they collect. Questions of copyright must be managed so that digital information can be created and distributed throughout "digital libraries" in a manner that is equitable for both information producers and information consumers. Copyright could become an insurmountable barrier to the development of digital collections. There are indications that content providers unhappy with the protections afforded them under copyright law, will turn to contract law and licensing for protection. Libraries are already experiencing the administrative burden of managing site licenses for electronic information such as CD-ROMs and data files. Licensing provides content providers with a stronger mechanism to control the transmission and use of information. This has the effect of moving information from a realm where ideas are allowed to flow in the public domain, to one where this flow is controlled by the provider. There is an increasing unease among members of the library community that copyright changes will adversely affect the ability of libraries to provide digital collections and services. The discomfort librarians feel is justified. One has only to consider the statement of the International Publishers Copyright Council. on digital library collections to sense the challenge that librarians face:

Many national and regional libraries contemplate digitizing their print collections to facilitate a virtual library that can provide service to patrons at remote locations and facilitate resource-sharing. Such a concept will destroy not only the incentive to create new copyrighted works, but the revenue from existing works that provides the investment in new works by authors and publishers. [I.P.C.C. 96].

Information providers such as publishers increasingly see libraries and themselves as sharing the same customer base. Publishers view libraries as threats to their market. What is being established is a sense among publishers that they are in the same business as libraries:

No longer will libraries be the sole repository of published matter. No longer will libraries be the only means of obtaining archival information. In some areas, libraries will be able to fulfill their function by merely pointing to other electronic repositories and in others they will seek out more active roles. [I.P.C.C. 96] But remains important to remember the "public" is not the same as a "customer" and access to "publicly available information" is not a product. Herein lies a fundamental difference between libraries and commercial information providers. Under restrictive conditions of use, whether imposed by contract or some revised copyright legislation, "digital libraries" will not be able to satisfy many of the imperatives of information anywhere, anytime. Libraries will be required to provide reasonable assurances to content providers that the terms of their licenses can be maintained, and that distribution of copyrighted materials are restricted to particular users or locations. It is even likely that users will have to visit the physical building

of the library since the digital collections may only be available on particular workstations or require special equipment to access the materials.

Cost

Information has never really been free. There is always a cost in its creation, its production, and its dissemination. Freely-accessible public libraries, subsidized through taxation, largely hide the real cost of information from library patrons and this is appropriate where libraries are considered as a public good. "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. A major assumption of the information age, is that information will be available to all for a fee. This assumption runs counter to the ethos that underlie libraries. It will be a cruel irony that the very technology that holds so much promise of providing access to digital information *en masse* will end up restricting it to only the very few that can afford it. What is affordable for some users, isn't for many others. "Digital libraries" may be privately owned corporate services and collections to which subscription, pay-per-use, or licensing fees may apply. Libraries are already having a taste of this future as they wrestle with restrictive licenses for the use of data tapes and CD-ROMs. Users are often required to use digital materials on-site in order to satisfy the contract requirements of the information providers. The TULIP final report suggested that "building digital libraries will be a costly and lengthy process" and that making additional funds available for this content "will not be a trivial issue." The "harsh economic realities" are that digital collection development entails heavy costs for implementation, licensing, training, promotion, and the development and support of a technical infrastructure. Furthermore, the report suggested the one critical issue, which was not resolved was "how to make the transition to digital libraries work economically." [TULIP 96] Economic models for making the "digital library" work, in terms of real costs and benefits, have neither been clearly articulated nor established.

IV. Challenges in Digital Library

The computer viruses, lack of standardization for digitized information, quick degrading properties of digitized material, different display standard of digital product and its associated problem, health hazard nature of the radiation from monitor etc. makes digital libraries at times handicap.

a. Copyright: - Digitization violates the copy right law as the thought content of one author can be freely transfer by other without his acknowledgement. So One difficulty to overcome for digital libraries is the way to distribute information. How does a digital library distribute information at will while protecting the copyright of the author?

b. Speed of access: - As more and more computer are connected to the Internet its speed of access reasonably decreasing. If new technology will not evolve to solve the problem then in near future Internet will be full of error messages.

c. Initial cost is high: - The infrastructure cost of digital library i.e. the cost of hardware, software; leasing communication circuit is generally very high.

d. Band width: - Digital library will need high band for transfer of multimedia resources but the band width is decreasing day by day due to its over utilization.

f. Efficiency: - With the much larger volume of digital information, finding the right material for a specific task becomes increasingly difficult.

g. Environment: - Digital libraries cannot reproduce the environment of a traditional library. Many people also find reading printed material to be easier than reading material on a computer screen.

h. Preservation: - Due to technological developments, a digital library can rapidly become out-of-date and its data may become inaccessible.

V. Conclusion

Technology experts have suggested that the future electronic information environment should be based on an "underlying ethos of abundance rather than scarcity" of information. [ARL 94] In this view, it is the *context* not the content that will be locus for value. "The future belongs to neither the conduit nor content players," posits Paul Saffo of the Institute for the Future, "but to those who control filtering, searching, and sense making tools we will rely on to navigate through the expanses of cyberspace." [Saffo 94]. Esther Dyson, a well-respected commentator on technological developments concurs. The "value shifts from the transformation of bits rather than bits themselves, to services, to the selection of content, to the presence of other people, and to the assurance of authenticity - reliable information about sources of bits and their future flows." [Dyson, 94] Librarians should be heartened by this future. Computers only manipulate numbers³it is people that connect them to meaning. Librarians provide context to users. Even as the stuff of

library collections begins to change and become collocated in the private digital libraries of publishers and content owners, the value of librarians who can effectively turn mere data into knowledge will be paramount. A "library" has always been more than a building containing books, or a computer on a network full of documents. In some respects, "digital libraries" are not new: libraries have been using technology to facilitate access to information for years and telephone reference can easily be considered a type of "digital library" service. Following the direction suggested by Esther Dyson, librarians might willingly accept the "depreciation of intellectual assets and property", i.e. digital collections, while finding a greater appreciation in the "intellectual processes and services" that a "digital librarian" might provide. A different view of the future might be one where a "digital library" is more like a "knowledge center", where a complex system of professionals whose expertise supports access to information and acts as an intermediary to a variety of digital and other sources. These digital librarians/knowledge workers, who imbued with an ethic of equitable access, would function as well-trained intermediaries in an heterogeneous information environment³⁴an environment that if not actively hostile to users is certainly confusing³⁴to find and make sense of the masses of data for their users. The knowledge that "digital librarians" bring to this information environment would make sense of a multiplicity of digital and paper-based collections and resources, provide access to a network of key contacts, identify cost effective strategies for information retrieval, and assist users in the publication and creation of new information. Open access to information³⁴it is this principle that lies at the heart of the modern library, digital or otherwise. It is this principle which must be upheld against the many forces which might diminish its enlightening force. But perhaps open access to information in the future does not mean open stacks and digital collections. Is it possible that the principle might be changed slightly to "open access to knowledge", a principle which suggests a right to publicly accessible professional services that can guide users through information flows and mediate information overload? Is it not possible that the value of libraries is not in the collections, but in the librarians? In a turbulent technological environment, perhaps a change of scenery is required. Redirecting the focus of librarians' attention and resources from the development of "digital libraries" to the development of "digital librarians" will be vital to the future of the profession. The time has come to invest in people and not in technology. Central to the vision of the new digital library is a digital librarian/knowledge worker who cares about people.

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