ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 08, pp.56815-56819, August, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

MAJOR ISSUES IN DIGITAL LIBRARY DEVELOPMENT

***Dr. Saroj Kumar Singh**

Department of Rural Economics, S. N. S. R. K. S. College, Saharsa PIN 852201 (A Constituent Unit of B. N. M. U. Madhepura), Bihar, India

ARTICLE INFO

Article History:
Received 17th May, 2017
Received in revised form
16th June, 2017
Accepted 23rd July, 2017
Published online 31st August, 2017

Key words:

Electronic Library,
Library Development,
Higher Education,
Documentation,
Manpower.

ABSTRACT

The predominantly paper based erstwhile environment all these contents were put tosimilar types of use, and copyright restrictions were imposed based on the quantum ofpages copied etc. In the electronic and digital perspective, owners of information areresorting to punitive measures regarding the use and contents in digital form. Some ofthe constraints faced by our libraries to engage in serious digital initiatives are three fold- that of money, manpower and contents. Most of our libraries, particularly in the highereducation and research institutes solely depend on the information providers andpublishers in the developed world to satisfy their urge for vital contents that inspireindigenous research. Since contents are a major ingredient in digital librarydevelopment, the pragmatic and viable way out for libraries is to judiciously judge themas available in electronic forms in optical media or on Web and procure at least some ofthem for hosting locally. This paper presents some of the major issues involved in such acritical activity with some illustrative examples available like IEE/IEEE ElectronicLibrary, Indian Standards on CD-ROM, Science Direct, and Web access of IndianAcademy of Sciences journals. The justification for selecting external contents has alsobeen mentioned. A detailed checklist for evaluating contents is presented from variousangles, like authenticity of content, user interface, search and display capabilities,documentation and technical support, and Media dependent features.

Citation: Dr. Saroj Kumar Singh, **2017.** "Major issues in digital library development", *International Journal of Current Research*, 9, (08), 56815-56819.

INTRODUCTION

The terms used to describe digital library, to denote a subset or a superset or sometimes to denote a rather different concept of digital libraries, are described below. In a Traditional/Real Library, holdings are in hard copy form and there is not any type of computerization, in terms of products, operations, or services. Virtual Library/Library without walls/Library is a library with little or no physical presence of books, periodicals, reading space or support staff, but one that disseminates information directlyto the distributed users, usually electronically. Hybrid Library/ Gateway Library/Complex Library, as a continuum from traditional library to the digital library, with electronic and paper-based sources used alongside oneanother, may be viewed as a transitional stage towards a trulydigital library. In Digital Libraries, the services are fully

Automated where all resources are in Digital form.

The US Association of Research Libraries identified five elements common to all definitions of the digital library, in October 23, 1995:

- The digital library is not a single entity,
- The digital library requires technology to link the resources,
- Linkages between digital libraries and information services are transparent to users,
- Universal access to digital libraries must be a goal,
- Digital library collections are not restricted to document surrogates but include digital artifacts that have no printed equivalent.

Digital Libraries offer such benefits as equitable access, reduced barriers of distance, timeliness, shared resources, and content delivery. Digital libraries have been the prerogative of the developed world, and due to the advancements and affordability in computer and communication technology, they are, though slowly, getting importance in other countries.

National status

In a broader sense, we can define digital libraries as organizations that provide resources, including specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections. Digital works so that they are readily and economically available for use by a defined community or

Corresponding author:* **Dr. Saroj Kumar Singh,
Department of Rural Economics, S. N. S. R. K. S. College, Saharsa PIN 852201 (A Constituent Unit of B. N. M. U. Madhepura), Bihar, India.

set of communities.With the increasing applications of web technology for library work, several libraries in the country are involved in development efforts on disseminating information through local Intranet as well as Internet. However, significant efforts on digital library development were meager in the country due to several constraints.

Infrastructure constraints

Not only is the weak computer infrastructure in libraries and affiliating institutions creating the major hurdle, but also the lack of high capacity bandwidth for network and Internet access. Hope that situation will soon improve due to the concerted efforts on various fronts as VSNL and BSNL are engaged in a massive action plan to enhance the communication infrastructure in the country.

Lack of Professional Expertise

Expertise can be generated through either retraining the existing staff members with the help of continuing education programmes or by including digital library components in the professional courses to give the desired exposure to budding professionals. In a professional service stream like information science, strong compartmentalize would not yield any satisfactory results, and it is high time that we should involve computer and communication professionals to assist us in access provision of whatever contents we are so good at collecting, ordering and servicing.

Absence of High Quality Contents

The overall impact of India's research output on the growth of disciplines like Science and Technology is a matter of introspection. In these disciplines, where considerable progress has been made on digital access provision, most of the publishers, authors, and information providers are based in the developing world. Most of the best research papers from the country are beingdisseminated through foreign publications due to various reasons. In such a premise, even contents, where our country has a stronghold like arts, folklore, spirituality, traditional knowledge etc. are being sidelined. As the usage and reach of contents in digital form are far more wide reaching than the printed text, and the process of digitization involves cost in terms of contents, systems, expert man power, care should be exercised on what sort of contents need to be digitized.

Contents in a digital library

For better or worse, today's technology enables virtually anyone to publish digitally. The roles of the technologist-as-tool-builder and the information professional-as-contentorganizer complement each other in expanding ways. A variety of distributed repositories may offer digital collections, including the content, and metadata, to various libraries, and may themselves offer complementary or competitive library services.Thereis considerable experimentation underway regarding the technical, economic, andorganizational supports necessary for such distributed arrangements in organizing, providing access to, and preserving knowledge that is born digitally, in digital librariesproviding access to information that is needed to extend the reach of the scholarly enterprise to new audiences. Almost every type of information can be represented in digital form, including text, pictures, musical works, computer programs, databases, models and designs, video programs, and compound works combining many types of information. In the digital library, what you store is not what you get. The digital contents available in the world are organised in many different ways and have to be accessed through a variety of mechanism.

When comparing electronic information resources, we must answer the following questions.

- What is the library trying to accomplish?
- Who are the users and what are their needs?
- What are the available resources?
- How librarians, staff, and users are to be trained?
- How we plan access to the service or resource?

Since much of the same information is available in a variety of formats including print, CD/DVD-ROMs, online databases and Internet sites, it has become necessary to find a way to compare them and to choose the one that best fits your need in order to get the maximum with the limited budget available to most libraries. The latest technology, DVD, and the economical availability of powerful PCs along with declining DVD prices and steady increase in DVD content will have many libraries seriously considering this option. If a library does not have access to the Internet, then the local computers or networks providing access to a variety of CD/DVD-ROM products may be the onlyviable option to provide access to electronic content.

Types Contents

There can be two types of contents in a digital library:

Developed in-house by the library

A major portion of this comes from the parent institution in the form of research/progress reports. The library professionals can alsoassist the experts in the institution to repackage information published in several sources. A large extent of the collection, predominantly in print form, procured by libraries are not amenable to electronic access partly due to technical problems (how much of such content can a library key- in and how far they scan) and partly copyright restrictions. As such, the copyright rules enforce only use and no modification of content, and contents in electronic form are easily modifiable forcing content providers to ensure tough measures against infringement. Thus, only a limited area of the local collection can be digitized in the absence of any lobbying on part of libraries, institutions, and users against the sellers. The constraints on the national scene elaborated earlier, also vouch for the difficulty to locally digitize contents even when available. A viable way out for a large number of libraries in the country is to host contents procured from outside. Here, in some cases, selection is required to priorities contents, which can create maximum impact among large number of users. Even bias in identifying as well asselecting contents is tolerable as the library can justify the shortfalls with its ideal plan todigitize all locally generated contents, which is not be the case with external contents.

External - contents procured from outside

It includes Bibliographic Databases, E-journals, E-books, Full Text databases, and Reference sources of encyclopedias,

Dictionaries, Directories, Atlases etc., published in both optical media and madeaccessible through Web. Comparable advances are taking place consistently in opticalstorage technologies and the provision of formal information resources on web. Thus,discussion about these two media for delivering information resources are considered inthis paper, though we are now witnessing an unmistakable migration away from CD/DVD-ROM based products towards information resources accessed via Internet or Web.

Why select external contents?

Selecting externally procured contents has beencrucial in the emerging information-servicing scene predominantly due to:

- **Flood of such contents:** The so-called information explosion has now become acliché, but there is absolutely no end to this phenomenon because of improvementin human resource index the world over, thus leading to vigorous education, research,and publishing activity.
- **Costly:** We are moving away from the concept of knowledge is power to informationis power. As such, knowledge cannot be stolen, but absolutely that is not the case withinformation and ownership of information may be regarded as a prestige by theadvanced countries. Moreover, the generation and production of information is also avery intensive activity that requires continuous supply of money, manpower, andother materials like laboratory instruments and computer systems. Most of the sourcesare also exhibiting an unavoidable rise in prices in subsequent editions.
- **Limited library budget:** Libraries are continuing to function as mere spendinginstitutions partly due to conventional work style, and partly due to lack of seriouspolicy measures against functioning. Coupled with this is the ever-pervading problemof regular depreciation of Indian currency with major currencies in which we buycostly information resources such as, Dollar, Euro, Yen, etc. Librarians and librarieshave devised certain action plans like interlibrary loan, resource sharing, networking,and now consortia to arrest at least a part of the information erosion that has come upas a result of 'more sources to be bought with equal or less money.

The selection of external contents could be achieved in a more realistic fashion byevolving concrete measures to assess their quality and suitability to users.

Criteria for assessing external contents

Some of the time tested parameters, information professionals used earlier, to evaluate electronic information products could be applied to judge and arrive at an objectiveselection of potential products.

Authenticity of contents

Authenticity of contents refers to the genuineness of the object. An authentic object iswhat it purports to be in origin and content; and has integrity. Concerns aboutauthenticity of sources are not new and arise in many ways and forms. Several studies touched up on the crucial problem of evaluating information products.

Some parameters that may help us in evaluating authenticity include:

- **Content:** is it complete and internally consistent?
- **Context:** is it coherent in relation to other related materials?
- **Fixity:** is there an authorized, canonical version?
- How is it identified?
- **Provenance:** what is the origin and chain of custody of the object?
- **Trustworthy:**Are the creator andthe custodian reliable and trustworthy?
- **Visibility:** can the object be reliably cited and found?
- **Audience:** intellectual level in which the subject matter is discussed?
- **Authority:** reputation of the players like publisher, compiler, and indexer/abstractor inthe field?
- **Scope:** style of subject presentation, coverage, update, and language.
- **Comprehensive indexing:** How well indexed to allow pinpointed non-linearconsultation.
- **Time lag:** Are you getting the old wine in a new bottle? Currency of subject coverageis a crucial factor to decide usefulness of scholarly contents.

User level

- **Software friendliness:** Overall, ease of use of the system.
- **Level of Interface:** Whether the system is designed to suit end-user searches oronly persons with requisite training can handle it.
- **Quality of help:** How good are the help messages in guiding a user to comeout of a crisis during search?
- **Error handling:** Are the error messages self-explanatory enough to point outthe vital errors.
- **Menu-Driven System:** Has the system being designed as menu driven orcommand driven? In the emerging graphical supported search systems, amenu driven system must be the natural choice.
- Hypertext, Hyper multimedia applications.

Search Capabilities

- **Boolean Search:** Supports combination of search terms using the Boolean operators of and, or, and Not.
- **Proximity searches:** Term relations could be better expressed and controlledby using proximity search measures.
- **Range searches:** Restricting searches by any peculiar characteristic of the fieldconcerned.
- **Interactive query building:** Does the system promises the search process to beinteractive enough to modify terms during the search process, including termsfrom retrieved records, etc.
- **Response Time:** How fast is the system to output search results?
- **Information exhaustiveness in records:** Mechanism and transparency by whichthe bibliographic to full text linking is guaranteed.
- **Searchable text fields:** Exhaustive indexing conducted to make searchesamenable to different fields.
- Graphic support etc.

Display Capabilities

- **Managing search results:** Features and support provided by the system tomanage the query results.
- **Display formats:** Style and variation of displaying query results.
- **Sorting:** Does the system support arranging search results in a sorted order.
- **Avoiding errors:** How free is the system from typographic or other errors indisplay?
- **Appearance:** Aesthetically designed color combinations and headings fordisplay.

Documentation

- **Manuals:** Carefully designed and explanatory manuals.
- **Online help messages:** Electronic version of the manuals as context sensitivemessages in a pick and access mode.

Technical Support

- **Spread:** The reachability of support provided by the vendor. Have they gotservice points in your vicinity?
- **Depth:** Technical supports are provided up to what level.
- **Duration:** How long services are encouraged?
- **Nature:** Are the services being provided free or on payment?

The media intrinsic constraints for distributing contents will be discussed in the nextsection. Being two media, some of the parameters needed for one may not suit best toevaluate another, and that is why such parameters are separately listed out.

Media dependent features

CD-ROM and other optical media for distributing information contents in a store anddistribute manner is quite different from hosting such contents in a hypertext format onone http server or on mirror sites. However, in some areas like user interfaces, one can see awhole similarity emerging in recent times, as more and more CD databases supportaccess through web browsers in the Intranet.

CD-ROM Resources

- **Availability:** Presence of a desired resource in CD form,
- **Price:** Pricing must be compelling to other media like print, web, etc.
- **Hardware/software:** Does it support the existing library computer systems andperipherals in terms of operating system, network software? Any other extrasoftware is to be procured to make the product work.
- **Credibility:** How best the producer and/or distributor are regarded in terms ofcustomer orientation, usage rights and licensing agreements? Whether usercan keep archival discs for lapsed subscription? Warranty periods and otherspecial offers bundled with the purchase.

Web Resources

A competitive analysis done by William Saffady, based on a survey of availability of 33popular databases from ABI Inform to TOXILINE, in 21 Web-based bibliographic search
Services, from Dialog to Proquest Direct, are published in Library Technology Reports.

- **Visually appealing:** The web sites should be designed in a manner so that theyare aesthetically attractive to users.
- **Value:** The contents must add value in the web media rather than a meretranscending to web. The hypertext linking should be so organised that theutility of the source could be optimum.
- **Currency:** The information provided on the web must reflect the current stateof affairs on the topic. Emphasis must be made to refresh the contents asfrequent as possible.
- **Navigable:** The hypertext linking should be so organised that the utility of thesource could be optimum.
- **Easy to find and use must** be well indexed with the search engines so thatthey must be easily noticeable to people.
- **Interacting with and responsive to users:** Provision must be made to interactwith users through forms and options to accept preferences so that only whatis essential and required to one user will be flashed on the system when s/he isusing it.
- **Site maps:** Should contain site maps to authentically state what is kept andwhat is not.
- **Archives:** Maintaining an archive of old information for those who wish tobrowse such data, may be to satisfy historical interest or to gather information, which had been published only then.
- **Security and licensing policy:** In case the content is provided for a fee on theweb, what are the policy options framed in terms of licensing of use, and tosecure the content from unauthorized access and hacking?
- **Formats used:** The files must be maintained in what formats- pdf, html, ps,and what are the inherent merits or limitations of doing so.
- **Speed of access:** How easy it is to download and print?
- **Internet infrastructure required** Not only at the institutional level, but at thenational platter too. Institutions should arrange with ISPs for enhancing theirInternet infrastructure at the local level through leased lines, V-SATs, etc.

Illustrative products

Four products, two each on CD as well as Web form (one on each category from India) issuggested to illustrate the availability of products that can be hosted as a digitalinformation facility at the local level.

CD-ROM Products: IEE/IEEE Electronic Library (IEL) on CD-ROM

A one- year subscription to theIEEE/IEE Electronic Library includes over 200 CD-ROMs containing over two millionfull-page PDF images of more than 500,000 articles from 2,000

publications published since 1988. The index part of IEL is a subset of the INSPEC database, and it usesVerity Topic search and retrieval software, which has a Windows based interface withpoint and click access through a web browser like Netscape or Explorer. It first displaysthe list of items that match the search statement and clicking on the title link displays theabstract with icons to get the full paper. When the particular full image CD is loaded onthe CD-ROM drive, the scanned image in PDF format of the complete article exactly as itappears in the original publication is displayed.

Indian Standards on CD-ROMs

Electronic version of Indian Standards is now

Available on CD-ROM, (distributed by Book Supply Bureau, New Delhi) with the optionto subscribe to the complete collection or separately to set(s) of standards coveringdifferent technical divisions like Civil Engineering, Chemical etc. It is updated onceevery two months and the electronic version is available from 11 October 1999.

Web Products

Science Direct (URL www.sciencedirect.com):

Elsevier science has been in theforefront of designing electronic alternatives for delivering high quality researchinformation to researchers the world over. The electronic programs started with researchand development for ADONIS in the late 1970s and continued with The University Licensing Program (TULIP), an experiment with nine American universities that ranfrom 1991-1995. Science DirectOnsite, launched in 1995 as Elsevier ElectronicSubscriptions, offered libraries local storage of complete electronic editions of more than 1,000 titles from the Elsevier Science list of journals. These programmes culminated inthe launch of Science Direct, in 1998, which offers Internet access from anywhere in theworld to the full text of over 10.74 lakhs articles from more than 1100 of the leadinginternational scientific, medical and technical journals from the Elsevier Science group.

Indian Academy of Science Journals (URL www.ias.ernet. in): The IndianAcademy of Sciences, founded and registered as a society in 1934, is now considered asthe single largest scientific publisher in the country publishes eleven journals covering allmajor disciplines in science and technology. Out of these, Proceedings- Chemical Sciences, Mathematical Sciences, Earth and Planetary Sciences, Sadhana-Academy Proceedings in Engineering Sciences, Pramana (Journal of Physics), Journal ofBiosciences, Bulletin of Materials Science, and Current Science, in PDF form can beaccessed freely on the Academy's web site.

Conclusion

Digital information facilities are getting much attention the world over due to theirintrinsic benefits over the prevalent paper based mode of distributing information. Theadvances in technology are increasingly reducing the gap between developing anddeveloped countries. A very few of our libraries were able to use online informationfacility, a few more were able to procure and service CD-ROM sources in a stand-aloneor network mode. Whereas when it comes to web, a large number of our libraries havebeen able to assimilate this technology either by using web information sources or byhosting them. Availability of qualitative contents in substantial quantity is the key toinvolve in full- fledged digital library development, where many of our institutions stilllag. The widespread availability of suitable products in the market may enable ourlibraries to taste the virtues of digital information. How such contents would be selectedand procured by carefully examining the products with the criteria listed in terms ofcontent, cost, and usability of external contents and hosting them on the library/institutionintranet or local network is the crucial question.

REFERENCES

Agarwal, P K. 1999. India's National Internet Backbone'. Communications of the ACM, 42 (6), pp. 53-58.

ARMS, William Y. 1995. Key Concepts in the Architecture of the Digital Library. D-LibMagazine, Available On- line at [http://www.dlib.org/dlib/July 95/07arms.html]

Bawden, David and Rowlands, Ian. 1999. Digital Libraries: developing a conceptualframework, The New Review of Information Networking, 5, 71-89.

Borgman, C L. 1999. What are digital libraries? Competing visions, Information Processing and Management, 35(3), 227-243

Breeding, Marshal. 1999. Does the web spell doom for CD and DVD? Computers in Libraries, 19(10), November/ December, p. 70-75.

Brophy, Peter. 2001. The Library in the Twenty First Century: New services for theinformation age. London; Library Association Publishing, xv, 223p. (ISBN 1-85604-375-4)

Bunker, Geri and Zick, Greg. 1999. Collaboration as a Key to Digital LibraryDevelopment: High Performance Image Management at the University ofWashington. D-Lib Magazine, 5(3), Available On-line at[http://www.dlib.org/ dlib/march 99/bunker/03bunker.html]

Carpenter Julie. 1999. Struggling to define the library of the future: some observationson "What makes a digital librarian?" The New Review of Information Networking, 5, 91-108

Crawford, Gregory A. 1999. Issues for Digital Library. Computers in Libraries, 19(5), p. 62-64.

Guenther, Kim. 2000. Designing and managing your digital library, Computers inLibraries, 20(1), 34-39

http://www.elsevier.com/homepage /alert/? Mode=tulip

http://www.ias.ernet.in/journals.html

http://www.ieee.org/products/online/iel/

http://www.sciencedirect.com/

http://wwwdel.vsnl.net.in/bis.org/iscd.htm

Saffady, William. 1999. Availability and Cost of Web-Based Bibliographic Search Services. Library Technology Reports, 35(1), 7-108

Schwartz, Candy 1993. Evaluating CD-ROM Products: Yet Another Checklist. CD-ROMProfessional, pp. 87-91.

Vijay Kumar, J K and DAS, Manju. 2000. CD-ROM to DVD-ROM: a new era inelectronic publishing of Databases and Multimedia Reference Sources. *IASLICbulletin*, 45(2), p. 49 – 54

Vijay Kumar, J K and Vijay Kumar, Manju. 2000. Realizing the Digital libraries: assumptions and challenges underlying it. (to be published in Dr. TejomurthiMemorial Volume, Ed. by Dr (Mrs.) Sonal Singh, Vikram University, Ujjain)

****