



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 6, Issue 9, September 2023



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.54



6381 907 438



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Impact of Digital Libraries System on Library Management Development and Services

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ABSTRACT: The development of DLs is felt for better management of information due to explosion of information and increasing multidisciplinary information needs of the users. Presently, the special libraries in India are in the state of hybrid (transition from print to digital) i.e. having both print and digital resources. Therefore, special libraries are facing various types of management problems as they have to manage both collections. The management problems can be grouped into following groups for understanding clearly. Group-1: problems of digital born collections: acquisition, organization, integration, preservation, access, usage, price/ cost, license agreement with publishers, perpetual access, ownership, secured access, digital rights management, acquisition of back files (archives), etc.; Group-2: problems with locally digitized collections: need for digitization infrastructure, trained manpower, copy right/ IPR issues, organization, integration, uploading/ updation on server, secured access through internet or intranet, etc.; Group-3: problems with digital information already existing in library: periodically change or shift information on current preservation technology for providing access by migrating, refreshing, etc.; Group-4 Common problems: IT infrastructure, preservation, archiving, human resource, budget, backup of resources, awareness generation, training to users and library staff, user friendly search system, etc. In view of above mentioned management problems, it has become clear that special libraries are really facing multifold problems in day to day management of DLs resources/ services.

KEYWORDS: Digital Libraries System, Library Management, Services, India, DLs resources/ services

I. INTRODUCTION

The management of DLs is very different from that of traditional libraries. In case of traditional libraries, there are established policies and guidelines for management of various activities like acquisition, technical processing, arranging, and access to printed materials, but in case of DLs, there are no such set procedures or guidelines for e-resources/ digital services. Therefore, special libraries/ information centres are facing many problems in the management, development and maintenance of effective DL services. Some of the problems in the management of DL include p-oper planning, acquisition or subscription, organization, preservation, access to digital resources/ contents, trained manpower, maintenance and up-gradation (especially hardware and software), back-up of resources, optimum usage of resources, cost of resources, training or awareness programs for users and staff, user friendliness system, IT infrastructure development, etc.

There are three different types of digital documents/ collections i.e. born digital, made digital by digitizing printed documents and microform documents. In case of digital born collections, some of the problems are variable pricing of e- publications (e-journals) to the libraries of different Institutions/ organizations, conditions of license agreement with publishers/ vendors, digital rights managements, gaps in digital collections if not subscribed continuously i.e. ownership, perpetual access, secured access, networking, rapidly changing technology and standards, etc. In case of digital collection development by digitization, some of the problems are copyright, digitization infrastructure development, organization of digitized digital collection by using suitable software and web technologies, preservation, access to digital contents though internet/ intranet for wider dissemination, maintenance of servers for 24x7 basis access, etc. One of the most burning problems in case of DLs is preservation of digital contents due to fast obsolescence of technology i.e. hardware, software and storage media (from floppies, CDs, VCDs, to current back-up devices). In addition, there are many other issues such as interoperability, integration of resources, organization of resources, information search interfaces, etc.

As regards the users, the DLs provide excellent features/ opportunities to the users to access and search world-wide information very conveniently (Bawden and Vilar, 2006) (37). It is an undisputed fact that DLs have also made a good



impact on the users because they are getting direct access to digital information/ resources at their own desktops/ laptops at any time, from anywhere (Chowdhury, et. al. 2006) (100), (Waris and Khan, 2010) (477). Now users are able to search current and/ or retrospective information by interacting with digital resources and can download if required. Here users do not depend on the librarians for getting their information from libraries as well as they do not need to visit library every time to get information. In spite of many advantages of DLs, there are some challenges like collections development, IT infrastructure, acceptability, access restrictions, readability, standardization, authentication, preservation, copyright, policy and strategic issues, user interface, funding, etc. Yet the advantages outweigh most of the bottlenecks and hardship yet to be ascertained. Therefore, the importance of DLs has been recognized by many nations of the world. India has also recognized the power of digitization and DLs and has taken a lot of initiatives in this direction (Singh, 2006) (415), (Singh and Paul, 2008) (416), (Singh and Sharma, 2013) (410).

From the above discussions, it has been noticed that the management of DLs/ resources, usage of digital resources/ services, and the impact of DLs on users and LIS professionals are very important factors for the development and maintenance of DLs.

II. CONCEPT OF DLS

The concept of DLs management is based on the following ideas: (i) make use of digital information/ object possible, (ii) protect original documents, (iii) maintain digital object, and (iv) ease access to digital object (Arora 2006) (23). Various strategies have been proposed and practiced from time to time but none is appropriate for all types of data, situations, and/ or institutions. This includes bit-stream copying (backing up data), refreshing (i.e. copying digital information from one long term storage medium to another of same type with no change whatever in bit-stream e.g. older CD-RW to a new CD-RW), technology preservation (i.e. operating systems, original application software, media drive, etc.), digital archaeology, analogue backups, migration from one hardware to other, replication, reliance on standards, normalization, canonicalization, emulation, encapsulation, etc. Frumkin (2004) (165) discussed ongoing interest in debating the concept of the DL, how to "demystify" the concept, and the importance involved in the development of the DL. In general there are two concepts in establishing DLs: 1) acquiring the resources in digital format (born digital) and using equipment, software, network, etc. to disseminate the digital resources.

Example: CDs, Floppies, DVDs, Database containing online, e-books, etc. 2) digitize the available resources of library without violation of copy right rules and sharing the resources among the users through latest technology. A library is said to be a DL when it provides information services to the users in a digital form (Patel, et.al. 2006) (342). For setting up and managing DL, the following are required depending upon the needs:

- Automation of entire library activities.
- Implementation of barcode technology/ RFID
- Online Public Access Catalogue (OPAC)
- Internet connectivity
- Resource dissemination through CD/DVD/ Mirror Server Network Technology
- Online database subscription
- E-Journals subscription
- E-books procurement
- Converting print resources into digital form by digitization
- Developing library information portal 11. Multimedia library services
- Library web page

III. THE DIGITAL OBJECTS

The larger volume of digital material that libraries access is mostly brought in from outside i.e. purchased or licensed from publishers or third party suppliers, or delivered free via the World Wide Web. Most of the data is now delivered and accessed through networks, though some is still supplied on optical disks like CDs/ DVDs/ VCDs. The largest growth area in the delivery of library data is currently online journals and e-books. The present range of digital objects includes:

- Library's own holdings that have been digitized
- Purchased datasets on CD-ROM
- Purchased datasets that are online
- Electronic publications that have a paper equivalent



- Electronic publications that have no paper equivalent
- Electronic reference works, which increasingly have no paper equivalent
- E-books

IV. POTENTIAL BENEFITS/ MAJOR CHARACTERISTICS OF DL

DL is very potential as a platform for the users as well as the librarians (Frumkin, 2006) (164). DLs have given lot of opportunities to the users (Gaston, 2006)

(173). DLs have many benefits over traditional libraries in terms of collections, services, access, convenience, time, efficiency etc. Some of the important benefits are as follows (Chowdhury and Chowdhury, 2003) (98):

- Allows users to access material remotely, off-campus, 24x7 as per their convenience.
- Allows access to many users simultaneously
- Instant access to information
- Currency of information
- Easy search features
- Convenient and time saving features
- Multimedia features
- Provides access to distributed information resources
- Paradigm shift both in use and ownership
- Ability to handle multilingual content
- Allows access to huge collections containing variety of information resources
- Reduces the need for physical space.
- No loss/ damage/ missing of documents, etc

V. DISADVANTAGES OF DL

On a broader level, we are facing a shift that may eclipse the significance of print and approach the impact of writing itself: for writing first stored human ideas outside of our brains and print enhanced the effect. DLs, where books read one another in however a rudimentary fashion, have already begun to separate intelligence and action from the human brain. Some of the disadvantages of digital libraries are given below:

- Affecting traditional habits of the readers
- Restricted access due to copyright/ license/ DRM, etc
- High cost for initial set-up
- Digital preservation media life
- Complex process for development and management
- No access to users who do not have facility to use (digital divide)
- High risk of data loss, etc.

VI. DL BARRIERS/ CHALLENGES

Management of digital resources undoubtedly has advantages over its analogue counterparts. However, (the risk of loss of data in digital form much greater than any physical form. (It is well understood and addressed to. 'There are enough cases where many' potentially valuable digital materials have already been lost and substantial cost was incurred to recover these digital contents. Libraries, museums, and archives face many challenges in acquiring, preserving, and offering access to their collections in digital age due to threat of techno- obsolescence, transform standards, dynamic nature of digital content, machine dependency, fragility and shorter life of media. different formats, forms and styles, copyright/ IPR issues, etc. Although having similar objectives, the different types of institutions tend to use different technologies and methods. With more and more digital born documents, new issues are raised in terms of cataloguing, search, and preservation. As the different types of institutions move closer together, they are seeking common frameworks for managing digital collections and content across the cultural sector. For users, the value of libraries, museums, and archives lies not only in their own resources but as gateways to huge distributed collections in other institutions. This, too, poses major challenges in terms of content management, namely, how to provide the user with seamless, high value, interactive services based on these distributed resources (DigiCULT) (149, 456), (I-saul and David, 2005) (346). There are many studies available on barriers challenges of DLs. Some of them are: Byrne (2003) (64) described the role of DLs as barriers as well as gateways to scholarly information; Culloch (2005) (114) reported about challenges and issues in terminology mapping; Joint (2006) (231) made study on risk assessment and copyright as a barrier; Nema (2003) (324) described about barriers in accessing e-journals, etc. Some of the barriers challenges



Identified for creating large and effective DLs are described below in detail (Library of Congress, 2003 (270 & 272); Hopkinson, 2009 (199); Greenstein, 2000 (184); Cleveland, 1998 (102)).

VII. BUILDING AND MANAGEMENT OF THE DIGITAL RESOURCES

It has been found that there is no single strategy, which is appropriate for the management of all types of data, forms, formats, language, etc., despite various efforts and proposals. -vristam (2002)

(452) describe various options available for digital management: preservations viz. bit-stream copying (backup data), refreshing, technology, preservation, digital archeology, analogue backups, migration, replication, reliance on standards, canonicalization, encryption, encapsulation, universal virtual computers. The other points need to be considered for the DL are: uniform resource characteristics (URC), or metadata storage management, microfilming and digital preservation, etc.

For building and managing effective digital resources by digitizing the documents of the library, the following considerations to be kept in mind.

Development of Improved Technology for Digitizing Analog Materials

In order to build and manage a comprehensive resource, the documents or materials now available in library in analog form (e.g., books, journals, laboratory records, sound recordings, manuscripts, and photographs) must be digitized by using best digitization technologies to produce highest quality reproduction of the original document.

Designing Search and Retrieval Tools that Compensate for Abbreviated or Incomplete Cataloging or Descriptive Information Providing access to library collections is labor-intensive. In order to apply scarce resources to the digitization of significant quantities of content, it is often necessary to reduce the level of detail offered in accompanying catalogs or indexes.

Designing Tools that Facilitate the Enhancement of Cataloging or Descriptive Information by Incorporating the Contributions of Users.

The DL can take advantage of distributed expertise. Collaborative tools could allow far-flung professional colleagues, e.g., faculty or graduate students in the universities, to provide excellent enhancements to materials they use for their own advanced research. The filters, methods for attributing enhancements without violating privacy or other protections against misuse could support this enhancement of the resource.

Interoperability

Interoperability is considered as a benchmark in DLs standard. In order to manage better interoperability among the DLs, it is essential to consider the following points:

Establishment of Protocols and Standards to Facilitate of Distributed Digital Libraries

The major questions are: how can a distributed resource like the National Digital Library be assembled to create a virtual unity? What types of protocols and what degree of standardization on types of digital objects will achieve a balance between feasibility of widespread implementation and coherence of access? Should unified searching use an approach (like that found in the 739.5() standard (distributed search) or the approach used by World Wide Web search engines (distributed indexing)? How can distributed digital libraries best safeguard the rights associated with content (including rights of privacy and conditions imposed by donors as well as copyright) while still providing the broadest possible access?

Development of Semantic Interoperability

At one level this is about the interoperability of software and systems. At deeper level it is about semantic interoperability through the mapping of ontology. Indeed, "deep semantic interoperability" has been identified as the "grand challenge of DLs" (Chen, 1999) (95).

Establishment of Common Schema for Description of Objects and Repositories

This is to establish common schema to enable distributed search and retrieval from disparate sources. Effectively, how can we enable individual users to search and browse within the context of their own personal ontology?



VIII. CONCLUSION

Digital libraries research and development has completed over two decades and a large number of digital libraries have been developed all over the world providing information access at local, regional, national, and international levels. With the progress of digital libraries development, various studies have been carried out on design and developments, barriers/ challenges, digital collections development and their usage, digitization and digital preservations, evaluation/ assessment, human resource requirements/ developments, IR initiatives, organization and management, marketing, OAI, roles of DLs, users and librarians or information professionals, development of suitable software/ hardware/ infrastructure, role of users in the design and development of DLs, impact of DLs, etc., for improvements in designs, features, access, effectiveness and efficiency, etc., of DLs. Presently every library is trying to develop digital library as well as IRS (particularly in India) for their users satisfaction as the users behavior in accessing/ searching information has been changed worldwide.

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