

## Scholarly Digital Library Initiatives: World Versus India

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### ABSTRACT

The emergence of digital technology and computer networking have provided means whereby information can be stored, retrieved, disseminated, and duplicated in a very fast manner. Digital libraries have made considerable advances, both in technology and its applications. The digital library initiatives at international level are many, but in developing countries like India they are still in a nascent stage. But with the initiative like Million Book Project, initiated by Carnegie Mellon University, the culture of digital library has also made a beginning in India.

**Keywords:** Digital library, digital library-international, digital library-India, Million Book Project, Carnegie Mellon University

### 1. INTRODUCTION

Providing right Information to the right users at the right time has been the motto of information professionals. Recent developments in information and communication technology (ICT), especially the Internet and the Web, have brought significant changes in the ways the information being generated, distributed, accessed, and being used. For centuries, the information was being provided through printed material made available by the systematic efforts of the publishers, booksellers, and librarians. But with the advent of ICT, the situation is changing fast as the printed information is being converted into electronic format and made available for use with the help of the computer networks. This resulted in the development of digital libraries at publishers, institutional and at individual's level to provide access to scholarly literature through World Wide Web (WWW). Today, the development

of digital libraries is fast picking up both in developed and developing countries using both commercial and open source software. This has changed the way in which information is being delivered to end-users by the libraries.

### 2. WHAT IS A DIGITAL LIBRARY?

The term digital library has varied meanings; ranging from a digitised collection of materials that one might find in a traditional library, through the collection of all digital information along with the services that make that information useful to all possible users<sup>1</sup>. Several definitions of digital libraries are available in literature. According to Borgman<sup>2</sup> there are two major classes of digital libraries; those coming from digital library researchers (in the US context they are mostly computer scientists and engineers), and those coming from library and information professionals.

Borgman further opined that the first research-oriented definition of digital libraries came in 1992 when the phrase 'electronic library' was used. The phrase 'electronic library' is now used as digital library. In digital libraries focus is given to the contents. Rosenberg<sup>3</sup> defined digital library as one where users access resources by electronic means, and where information is delivered to users electronically. However, Gladney *et al.*<sup>4</sup> gave the most comprehensive definition of the digital library. He said that, "a digital library is an assemblage of digital computing, storage and communications machinery together with the content and software needed to reproduce, emulate and extend the services provided by conventional libraries based on paper and other material means of collecting, cataloguing, finding, and disseminating information". A full service digital library must accomplish all essential services of traditional libraries and also exploit the well known advantages of digital storage, searching, and communication.

In fact, digital libraries, like traditional one, select, acquire, catalogue, classify, and disseminate information and knowledge. The major difference is the machine-readable data in digital library. This implies that the traditional concept of collection must be revised to accommodate materials that are accessible electronically.

### 3. TYPES OF DIGITAL LIBRARIES

Digital libraries can be grouped in the following ways<sup>5</sup>

- € Digital libraries developed in USA as part of DL11 and DL12 (Digital library initiatives).
- € Digital libraries developed in the course of eLib (electronic libraries) Programme in UK.
- € Digital libraries built by individual institutions.
- € Digital libraries that are part of National Libraries.
- € Digital libraries that are part of universities, or by period, or by country of their origin.

### 4. GENESIS OF DIGITAL LIBRARIES

The concept of digital libraries is rooted in the age-old dream of creating a virtual library. Among early efforts, one can quote the efforts made by Paul Otlet and his colleagues in 1930s in order to design functions similarly to today's hypertext and hypermedia system<sup>6</sup>. In 1945 Vannevar Bush<sup>7</sup> made some efforts to give an idea of connecting the entire human knowledge. He gave a concept of Memex machine, which used a microfilm reading process to retrieve

stored information. However, the interest in digital libraries, both scholarly and professional, grew very rapidly only in 1990s. As stated earlier, digital library developments in the USA took place mainly in the course of research led primarily by the computer science community that concentrated on designing and developing technologies for various digital library collection and services. Electronic Library Information Online Retrieval (ELINOR), started in 1992, was the first electronic project in the UK funded by De Mantfort University, the British Library, and IBM, UK<sup>8</sup>.

Today, there are umpteen numbers of digital libraries worldwide. Some of the important projects at international level and in India have been highlighted here from the perspective of open access to scholarly literature. The projects undertaken at commercial level have not been included in this study.

## 5. INTERNATIONAL SCENARIO

### 5.1 Akron-Summit County Public Library's Digital Library (<http://www.akronlibrary.org/digital-lib/index.html>)

It is an ongoing effort, which provides access to the local history resources. The Special Collections Division of library has selected and digitised items from some Akron-Summit County Public Library's collections. The collection includes two exhibits, viz., library history exhibit and Tallmadge history exhibit.

### 5.2 Alexandria Digital Library (<http://www.alexandria.ucsb.edu/>)

The Alexandria Digital Library (ADL) is a distributed digital library with collections of geo-referenced materials. ADL includes the operational library with various nodes and collections, and the research program through which digital library architectures, gazetteer applications, educational applications, and software components are modelled, prototyped, and evaluated. ADL provides HTML clients access to its collections and gazetteer, and provides specific information management tools such as the feature type thesaurus for classing types of geographic features as well as downloadable software code.

### 5.3 Arizona Memory Project (<http://azmemory.lib.az.us/index.php>)

The Arizona Memory Project (AMP) was launched in March 2006 and has been granted the Arizona

Centennial 2012 legacy project designation by the Arizona Historical Advisory Commission. AMP is an online effort to provide access to the wealth of primary sources in Arizona libraries, archives, museums and other cultural institutions. This initiative provides the opportunity to view some of the best examples of government documents, photographs, maps, and objects that chronicle Arizona's past and present.

#### **5.4 California Digital Library (<http://www.cdlib.org/>)**

The California Digital Library supports the assembly and creative use of the world's scholarship and knowledge for the University of California libraries and the communities they serve. The library provides its community with more digital material including more than 21,000 electronic journals, tens of thousands of electronic books, and more than 250 articles and reference databases.

#### **5.5 Collaborative Digitisation Program (<http://www.cdphheritage.org/>)**

The collaborative digitisation program (CDP) began in the fall of 1998 as the Colorado Digitisation Program, funded by a Library Services and Technology Act (LSTA) grant through the Colorado State Library. The CDP endeavours to provide meaningful content on human culture, science, and art to everyone connected online. The photographs, maps, documents, sound recordings, and objects held by the partner museums, libraries, and archives offer a rich and insightful glimpse into human culture.

#### **5.6 Digital Library Frankfurt ([http://haddouti.de/projects/dl\\_de.html](http://haddouti.de/projects/dl_de.html))**

The project concentrates on two main goals: (i) the structuring and electronic presentation of existing documents (document project) and (ii) the development of an infrastructure for digital libraries (infrastructure project). The document aims at providing access to paper documents by scanning and converting them into standard generalised markup language (SGML) documents.

Efforts for developing computer-supported SGML structuring of scanned documents are on. The SGML documents will be accessible via WWW and via the online public access catalogue (OPAC) of the Stadt- und Universitätsbibliothek Frankfurt (StUB). The goal of this infrastructure project is the development of an efficient, scalable and dynamically extendable infrastructure that allows the storage, retrieval and presentation of documents containing different media

types. Mobile code techniques are employed to fulfil this goal.

#### **5.7 Digital Library of Georgia (<http://dlg.galileo.usg.edu/?Welcome>)**

The Digital Library of Georgia is a gateway to Georgia's history and culture in digitised books, manuscripts, photographs, government documents, newspapers, maps, audio, video, and other resources. The Digital Library of Georgia connects users to 5, 00,000 digital objects in 90 collections from 60 institutions and 100 government agencies.

#### **5.8 Digital South Asia Library (<http://dsal.uchicago.edu/>)**

The Digital South Asia Library (DSAL) provides digital material for reference and research on South Asia to scholars, public officials, business leaders, and other users. Participants in the DSAL include leading US universities, the Centre for Research Libraries, the South Asia Microform Project, the Committee on South Asian Libraries and Documentation, the Association for Asian Studies, the Library of Congress, the Asia Society, the British Library, the University of Oxford, the University of Cambridge, MOZHI in India, the Sundarayya Vignana Kendram in India, Madan Puraskar Pustakalaya in Nepal, and other institutions in South Asia.

#### **5.9 Digital Library for International Research (<http://www.aiys.org/aodl/index.php>)**

Building on the established libraries and research collections of its 19 constituent centres, the Council of American Overseas Research Centres (CAORC) in 1999 launched the American Overseas Digital Library (AODL) as a cost-effective, efficient, centralised, Internet-based mechanism for the standardisation, and electronic delivery of important bibliographic and information from full-text primary and secondary source from all CAORC member centres, covering both print collections and research collections in other media.

The initial resources for the AODL program were located in overseas centres in Europe, the near and middle-east, south and south-east Asia, and West Africa. Plans are now underway to include bibliographic materials from inner Asia, the new world as well as countries that host centres. In November 2004, the Program's name was changed to Digital Library for International Research (DLIR) to reflect this new level of participation and coverage.

### **5.10 Indiana University Digital Library Program (<http://www.dlib.indiana.edu/>)**

The Indiana University Digital Library Program is dedicated to the production, maintenance, delivery, and preservation of a wide range of high-quality networked resources for scholars and students at Indiana University and elsewhere.

### **5.11 Library of Congress (<http://www.loc.gov/library/libarch-digital.html>)**

The National Digital Library programme of Library of Congress (LoC), USA has created an American Memory Database (AMD). AMD, the flagship of the LoC's digital services, offers multimedia collections of digitised documents, photographs, recorded sound, motion pictures, and text from the American historical collections of the LoC and other institutions. It has now more than 7.5 million digital items from more than 100 historical collections.

### **5.12 Michigan Digitisation Project (<http://www.lib.umich.edu/mdp/>)**

The University of Michigan and Google, Inc. have entered into a ground-breaking partnership to digitise the entire print collection of the University Library. The digitised collection, called MBooks, is searchable in the library catalogue, Mirlyn as well as in the Google Book Search. Full-text of works that are out of copyright or are in the public domain.

### **5.13 National Library of Australia (<http://www.nla.gov.au/digicoll/>)**

In 2001 the National Library of Australia embarked on a major digitisation project in order to provide improved access to its wide and diverse collection of material in traditional formats. In 2004, digitisation of still image collection became a mainstream activity. Significant quantity of original Australian material has been digitised including pictorial material, maps, sheet, music, manuscripts, and selected print items.

### **5.14 Networked Digital Library of Theses and Dissertations (<http://www.ndltd.org/>)**

The Networked Digital Library of Theses and Dissertations (the "Corporation") is a non-stock corporation duly formed under the provisions of the Virginia Non-stock Corporation Act. The Library is an international organisation dedicated to promoting the adoption, creation, use, dissemination, and preservation of electronic analogues to the traditional paper-based theses and dissertations.

### **5.15 National Science Digital Library (<http://nsdl.org/>)**

The National Science Digital Library (NSDL) is created by the National Science Foundation to provide organised access to high quality resources and tools that support innovations in teaching and learning at all levels of science, technology, engineering, and mathematics. NSDL is designed primarily for K-16 educators but anyone can access and search the library. Access to most of the resources is free. However, some content providers may require a login, or a nominal fee or subscription to retrieve their specific resources.

### **5.16 The New Zealand Digital Library Project (<http://nzdl.sadl.uleth.ca/cgi-bin/library>)**

The New Zealand Digital Library project is a research programme at the University of Waikato. Programme's aim is to develop the underlying technology for digital libraries and make it available publicly so that others can use it to create their own collections.

### **5.17 The Open Video Project (<http://www.open-video.org/>)**

The purpose of the Open Video Project is to collect and make available a repository of digitised video content for the digital video, multimedia retrieval, digital library, and other research communities. Researchers can use the video to study a wide range of problems such as tests of algorithms for automatic segmentation, summarisation, and creation of surrogates that describe video content; the development of face recognition algorithms, or creating and evaluating interfaces that display result sets from multimedia queries.

### **5.18 Utah Digital Newspapers (<http://www.lib.utah.edu/digital/unews/>)**

Utah Digital Library Project is funded by the Institute of Museum and Library Services and the Library Services and Technology Act. Commercial partners in this project include iArchives Inc., and DiMeMa Inc. This library contains about 42 newspapers.

## **6. INDIAN SCENARIO**

### **6.1 Digital Library of India**

The mission is to create a portal for the Digital Library of India which will foster creativity and free access to all human knowledge. It is piloted by the Office of the Principle Scientific Advisor to the Government

of India, Ministry of Communication and Information Technology with Indian Institute of Science and Carnegie Mellon University, USA as partners. Eleven academic institutions, six religious and cultural institutions, four government and research agencies, and two research institutions in India are participating in this programme. The current status of scanning centres of Digital Library of India is detailed in the Table 1.

**Table 1. Language-wise report as on 8th April 2005**

| Language  | Books | Pages    |
|-----------|-------|----------|
| Bengali   | 2     | 1059     |
| English   | 36283 | 13464420 |
| French    | 30    | 11304    |
| German    | 41    | 23305    |
| Hindi     | 155   | 38269    |
| Italian   | 6     | 4660     |
| Kannada   | 511   | 100655   |
| Norwegian | 5     | 1452     |
| Persian   | 1130  | 352032   |
| Sanskrit  | 2233  | 752880   |
| Spanish   | 8     | 3455     |
| Tamil     | 278   | 37350    |
| Telugu    | 14182 | 2854286  |
| Unknown   | 921   | 244355   |
| Urdu      | 1433  | 332222   |

Source: <http://dli.iit.ac.in><sup>9</sup>

## 6.2 INFLIBNET ([www.dspace.inflibnet.ac.in](http://www.dspace.inflibnet.ac.in))

INFLIBNET has developed a digital library by using Dspace, an open source software. So far INFLIBNET has digitised their conference proceeding namely, Caliber and Planner. INFLIBNET provide users the facility to download the full-text articles from its databases..

## 6.3 Kalasampada ([http://www.ignca.gov.in/dgt\\_0001.htm](http://www.ignca.gov.in/dgt_0001.htm))

Recognising the need to encompass and preserve the distributed fragments of Indian art and culture, and to serve as a major resource centre for the arts, the Indira Gandhi National Centre for the Arts (IGNCA) in collaboration with Ministry of Communication and Information Technology, initiated a project, Kalasampada (digital library: resources of Indian cultural heritage), for the development of databank of cultural heritage.

*Kalasampada* provides access to over couple of lakhs of manuscripts, over a lakhs of slides, thousands of rare books, rare photographs, audio, and video along with highly researched publications of the IGNCA from a single window.

## 6.4 Librarians Digital Library (<https://drtc.isibang.ac.in/>)

This library has been developed by Documentation Research & Training Centre (DRTC), and contains full-text of papers/articles related to Indian librarianship. Presently, it contains full-text papers submitted in DRTC seminars, papers submitted by LIS professionals, and theses/dissertations of students. It also has plans to include conference proceedings of Indian LIS Associations.

## 6.5 Nalanda Digital Library (<http://www.nalanda.nitc.ac.in/>)

*Nalanda* Digital Library initiated in 1999 at the National Institute of Technology (NIT), Calicut, is one of the largest digital libraries in the country. *Nalanda* helps members of the NIT in meeting their academic and research needs by providing timely and up-to-date information with value added services in all the areas of science, engineering, and technology.

## 6.6 National Library of India ([www.nlindia.org](http://www.nlindia.org))

The library preserves the scanning and archives the rare and brittle books and other documents on compact disc. The library will digitise the books and documents published before 1900 and available Indian publications prior to 1920. So far, 6,600 selected books in Indian and English languages have already been scanned and stored.

## 6.7 Raman Research Institute (<http://dspace.rrri.res.in/>)

Raman Research Institute has digitised the research publications of the faculty, students, and the publication of the institute. The Institute has also digitised its annual reports and newspaper clippings.

## 6.8 Universal Digital Library (<http://www.iita.ac.in/research/udl.html>)

Universal Digital Library seeks to digitise books of common interest to different communities of interest (COI) and make them available in a manner that is independent of language, location, and time. A complete solution for this was developed by Carnegie-Mellon

University, USA involving state-of-the-art planetary scanners for scanning, cropping, OCR, and XML converting. Apart from Indian Institute of Science (IISc), other Indian institutions involved in this project are NCST Mumbai, and IIIT, Hyderabad.

### 6.9 *Vidyanidhi* Digital Library and e-scholarship Portal (<http://210.212.200.226/index.html>)

Vidyanidhi is an information infrastructure, a digital library, a portal of resources and tools, and facilities doctoral research in India. Vidyanidhi is envisioned to evolve as a national repository and a consortium for e-theses through participation and partnership with universities, academic institutions, and other stake holders. It will enhance the access to Indian theses and will also enlarge the reach and audience for Indian doctoral research works.

### 6.10 Development of ETD

Many research and academic institutions have taken initiative to develop Electronic Theses and Dissertation (ETD) library in India. ETD basically includes theses and dissertations submitted in their own institution. Some of the prominent among these institutions are: IISc, Bangalore (<http://etd.ncsi.iisc.ernet.in/>); IIT Delhi, New Delhi (<http://eprint.iitd.ac.in/dspace/>); Indira Gandhi Institute of Development Research, Mumbai (<http://oii.igidr.ac.in:8888/dspace/>); and Sri Venkateswara University, Tirupati (<http://202.141.117.109:8080/dspace/>).

## 7. CONCLUSION

Digital library initiatives in India are still in a nascent stage of development. The digital environment in the Indian context is a new concept that can become reality through projects funded by the government and the initiatives taken by the Million Book Project.

Libraries, which would like to develop a digital library, must make careful planning and undertake feasibility study, as digital library projects requires careful selection of hardware, software, materials and standards to be used in their preservation. The sustainability of digital libraries is difficult unless organisations have good budgetary support and quality manpower.

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