DIGITAL LIBRARY INITIATIVES IN INDIA FOR OPEN ACCESS : AN OVERVIEW

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Abstract

The emergence of Internet has added a new dimension to information technology which gave birth to the new concepts of Digital Libraries (DLs), Knowledge Management (KM), and archiving of indigenous culture and heritage materials. The Digital Libraries have emerged as a crucial component of global information infrastructure, adopting the latest Information and Communication Technology (ICT) to promote an organisational structure that encourages communication and resource sharing between the academician and scholars across the nations. The present paper gives an overview of the latest developments, which have been taken place in the areas of digital library and an attempt is also made to give a brief account of Indian initiatives for establishing digital libraries and also effort taken by university/ institutional libraries to transform themselves from the traditional libraries to computerised and ultimately digital or hybrid libraries. In addition to that some initiatives taken by North Eastern States for the digitisation of manuscripts and rare materials, preservation of digital content etc have also been described in brief.

1. Introductions

Revolution in ICT (Information Communication Technology) in the past couple of decades had drastic and far-reaching impacts on all aspects of human life. Digital Libraries and Knowledge Management are the key areas that are still coming up in the developing countries and have a great potential to become an important technology in knowledge creation and its management (Kar, 2004).

We are witnessing an explosion of digital information, some of it in unstructured repositories, some in still primitive digital libraries. This trend is certain to accelerate, as the National Information Infrastructure (NII) and Global Information Infrastructure (GII) tends to become a reality. Several digital library projects in the developed nations and other countries are in progress, with the goal of developing the enabling technologies for creating a single, integrated and "universal" library composed of the large numbers of individual heterogeneous repositories. These include materials in personal information collections, collections in conventional libraries, and large data collections shared by scientists, engineers and other researchers. Address the following issues: how can we encourage global intellectual access and participation by our citizenry? How does one locate ("navigate") information of interest in a very large, distributed and possibly disconnected collection of libraries and archives around the world? And how can we protect the intellectual property of authors and publishers and detect violations in this new information environment? (Berry, 1996).

2.   Concept and Definition of Digital Library

The Digital Libraries are electronic libraries where the information is acquired, stored and retrieved in digital form. Digital Libraries are the group-interlinked workstations connected to the high-speed networks. In the context of digital imaging, librarians face greater challenges in capturing, storing, formatting, retrieval and reproduction of non-textual materials.

In digital libraries the e-resources are mounted on the servers located at remote places and the member libraries using user login and password on yearly subscription basis may access the information. The digital collection resources may be e-journals, bibliographic and full text databases, e-books, e-prints etc called e-resources that may be shown in the digital collection and catalogue of the member libraries for a particular period of time. The member libraries can access the resources simultaneously at a time or at different time. Therefore many libraries may use the digital collection available at one site at the same time without any problems over the Internet through Dial Up, DSL, Lease Line or VSAT Connectivity. So the digital libraries are libraries without wall and it is also known as virtual library in broader sense.

Library collection in digital form can be shared, exchanged and accessed by the members of the library and information network libraries as per their agreements or requirement. An important feature of the Digital object is that it can be stored, processed, and played back using a computer system, computer network and Internet. It allows us to search for any keywords of phrase or subject descriptor in the entire collection. It also occupies less space, require less manpower to run and manage the digital library, therefore it is very much cost effective. In India, Indian Institute of Science, Bangalore has established a digital library. It used IBM Digital Library Software.

Digital Library has been defined by a UCLA-NSF Social Aspects of Digital Libraries Workshop as 'Digital Libraries are a set of electronic resources and associated technical capabilities for creating, searching and using information In this sense they are an extension and enhancement of information storage and retrieval systems that manipulate digital data in any medium text, images, sounds, static or dynamic images) and exist in distributed network. The content of digital libraries includes data, metadata that describes various aspects of the data (e.g. Representation, creator, owner, reproduction rights), and metadata that consist of links or relationship to other data or metadata, whether internal or external to the digital library".

2.1   Elements of Digital Libraries

The U.S. Association of Research Libraries identified five elements common to all definitions of digital libraries:

- The Digital Library is not a single entity;

- The Digital Library requires technology to link the resources;

- Linkage between Digital Libraries and Information Services are transparent;

- Universal Access to Digital Library must be a goal;

- Digital Library Collections are not restricted to document surrogates but include digital artifacts that have no printed equivalent.

2.2   Information Infrastructure Requirement for Establishing Digital Library

For establishing digital libraries in the university/ institutional libraries, some basic information infrastructure in terms of hardware, software, electronic resources, Internet connectivity, specialised equipments like digital camera, scanners, sheet feeders, barcode printers etc. are required. 142 University Libraries in India has developed minimum information infrastructure from the Non-Recurring and Recurring grants received from the INFLIBNET Centre (an IUC of UGC) during IX Plan Period. These libraries have developed in-house bibliographical databases of books, serials, theses, reports, and projects and converted the various manual operations into computerised modules using library application software SOUL or some other commercially available software. Under UGC-INFONET: E-journals Consortium Projects of UGC, which are coordinated by the INFLIBNET Centre, are accessing the facility of full –text on-line e-journals, various full text and bibliographical databases over Internet, which are connected by the Broad Band VSAT, Leased Line, SCPC VSAT through ERNET. Now these libraries are hybrid library and partially trying to convert themselves into digital libraries by building the collection of digital library resources either by subscribing or by digitisation of their own resources and hosting them on web.

According to a survey a strong information infrastructure have been developed by the university / institutional libraries of India and are providing effective computer and networked based library and information services. These universities and institutions are well connected by the library and information network (Sinha, 2004).

2.3   Tools of Digital Library

There are various tools through which digital library can be operationalised in a network environment. These tools are e-mails, mailing lists, newsgroups, bulletin board, web form, polling, instant messaging, Chat, conferencing, Internet Telephony, video conferencing and virtual worlds.

For establishing Digital Library various hardware and software are needs to be integrated for the development and deployment of digital libraries to access huge collection of digital information in network environment. The basic components for establishing Digital Library System are as follows:

2.31   Hardware, which comprises of followings:

- Digital Computer powered by Pentium IV with high capacity hard disk for Server and Clients in the LAN, Web Servers and FTP Server etc;

- Desktop Workstations –PCs;

- Capture Devices such as Scanners, Cameras Cards etc.

- Cartridge Tape or Disk for backup;

- High Power UPS (10 or 20 KV)

- Printers (Laser and Ink jet printers (latest model), Consoles and Test Computers;

- Secondary Storage or Output Devices comprising of CD-ROM Disk (R and RW), DVD, CD-Tower, Flatbed Scanners and Optical Character Recogniser (OCR), Data Compression Device;

- High Speed Local Area Network (LAN, WAN), Internet Connectivity ether through Dial-up Connectivity or V-SAT, or through Lease Line or Radio Modem etc

2.3.2 Software

- Software: comprises of Operating software;

- Optical Character Recognition (OCR) Software;

- Scanning Software;

- Adobe Acrobat Reader;

- CD-Read/ Writer Software;

- Digital Library Software ie DSpace, Greenstone, Fedora. EPrint etc.

- Windows-NT Networking Software, SQL Server Software, Database Management Software;

- Web Designing Software like Java, Front Page, XML etc.

- RDMBS (Relational Database) Supporting the variety of Digital Databases like ORACLE, PosgreSQL, My SQL etc;

- Full Text Search Engines to index and provide access to digital resources

2.3.3 Digital Library Software

For establishing Digital Libraries some operational software is required. For this purpose, a number of digital library software is available which aim to offer complete digital library solutions. Generally the emphasis is being given to use open source software package, which can offer the solution to construct customised applications for handling and providing access to digital collection available over the Internet of in Digital Library Archives connected to Web. Besides this some supporting software is also required. Followings are some digital Library Software available, which can be used in developing digital library:

- Dspace is available at http://www.dspace.org: DSpace is a digital library system to capture, store, index, preserve, and redistribute the intellectual output of a university's research faculty in digital formats developed jointly by MIT Libraries and Hewlett-Packard (HP), DSpace is available to research institutions world-wide as an open source system that can be customized and extended.

- Green Stone Digital Library Software: It is Open Source Software available from http://greenstone.org under the term of the GNU General Public License.

- GNU E-Prints Archiving Software (Version 2.2.2): The software is available from http://www.eprints.org

- Ganesha Digital Library Software: GDL can be downloaded free of cost at http://gdl.itb.ac.id/download/

- Libraonix Digital Library System: The Libronix DLS is available from the site http://www.logos.com/products.

2.4 Provision of LIS Services in Digital Library

In digital library improved, instant and effective library and information services can be provided to the users irrespective of their locations. The information can be accessed either from the library itself or from the department in the campus network environment or from other places over Internet provided login and password for use is available with the end users. As per the services available in traditional libraries, improve services can be provided which are as follows:

- Access of CD-ROM based information retrieval services in a network environment;

- Access to On-line Public Access catalogue (OPAC) within the campus or over Internet;

- Provision of on-line circulation services (like reservation and queries);

- Online Subscription to journals

- E-mail/ Internet Access;

- Access to online databases for providing Indexing and Abstracting Services;

- Content Page Services;

- CAS and SDI Services through e-mail alert or group messaging;

- Online access to in-house databases through Campus LAN over Intranet;

- Access to Shared or Union Catalogue available at remote locations

- Document Delivery of Digital content on demand; and many more services as per the requirement of the users.

3.   Digital Library Initiatives in India

In Indian scenario the concept of establishing digital libraries is coming up. The modern computerised libraries where all library operation is being carried out by the specialised library application software and suitable hardware and software for creating and using library databases. These libraries are also having traditional collections but the are procuring digital resources in the form of e-journal subscriptions, bibliographical and Full Text Databases in CD-ROM/ DVD –ROM format, Online Databases of specialised subjects. These e-resources can be accessed over the Internet on IP based identification of users.

The concept of Digital Libraries and digitisation has started in the western countries in the last couple of decades back. In developing countries including India, the Government of India has already taken initiatives with the help from the United States of America. The National Science Foundation of the USA has initiated the "Million Book Project" at the Carnegie Mellon University in USA with India as a partner in this endeavor. The Indian Institute of Science, Bangalore, is the focal point of this activity in India. The project is an International cooperative attempt to digitize a million seminal books in fields that happen to be in the public domain or are copyrighted but out of print, making them freely available on the web to anyone at any time anywhere in the world. This helps bridging the barriers in terms of time, geographical location and economic strata of the users.

The project aims at digitizing a million books by 2005 in India alone. When completed, it will be an important contribution in the field of digitisation in India. Digital Libraries are however not expected to replace conventional   libraries in near future. These give access to information and material to everyone, without regard to place, time and economic status. As part of this project, India launched the ' Digital Library of India Portal' in September 2002. While inaugurating the Portal, Dr. A.P.J. Abdul Kalam, the Hon'ble President of India in his inaugural address said "India has taken the initiative at the right time".

As a part of the digitization efforts, the Department of Culture, Ministry of Tourism and Culture, Government of India, also launched the National Mission for Manuscripts in February 2003. Shri Atal Behari Vajpaee, the Hon'ble Prime Minister of India, inaugurated the Mission. The main objectives of the mission are to facilitate conservation and preservation of manuscripts through training, awareness, and financial support; to document, catalogue, and promote access to Indian manuscripts; to encourage scholarship and

research in the study of Indian languages and manuscriptology; and to build a National Manuscript Library. In addition to launching of National Mission for Manuscripts, Central Secretariat Library (CSL), under the Department of Culture, has undertaken massive work on digitizing the government document resources. In this endeavours, it has already undertaken work related to digitization of Gazette of India and commission and committee reports of the Central Government.

The major benefit expected from the mission are creating a National Directory of Custodial Institutions and Individuals and Subject Directories; Setting up a National Manuscript Library to provide central access to manuscripts; Sensitizing people about the rich intellectual heritage of India; Providing policy inputs to conserve, preserve, digitized, improve access and save manuscripts for posterity; Creating interest among research scholars and institutions to impart training in traditional India languages and subjects; and improving accessibility to all the stakeholders. The benefit likely to be available out of the efforts of CSL is to make the vast resources of the government information within the reach of the large segment of the society.

Indian society has created and preserved the vast resources of traditional and cultural heritage in various form. Hundreds of thousands of our are ancient books, classics, manuscripts, scores of them still preserved in palm leaves, urgently need digitization to preserve the valuable cultural heritage of India. We should take all precautions to preserve this national wealth, or else they would start disintegrating and would be lost to the mankind forever. Due to our failure in timely initiatives to save the resources, we have already lost a large number of such are documents which we would not be able to recover (Dhanendra Kumar, 2004).

The traditional libraries have started using ICTs and becoming computerised libraries where all library transactions are being carried out by computer system using appropriate library application software. The present day library is regarded as hybrid library where traditional as well as computer-based library services are being provided. In the classical libraries, information is carried out in the form of hard copy of the documents and Information and communication technology is hardly being used. On the other hand if we look at the digital libraries, where the word libraries is of course still referring to classical libraries, but where the information content as well as the information storage and retrieval system is completely running on digital, computer –based information and communication technology (Choudhury and Choudhury, 2003).

Many classical libraries have evolved to hybrid libraries, where we see classical documents and management methods, as well as more contemporary digital documents and databases, and management systems that are based on computers and computer-networks. Most of these hybrid libraries are not on the road to evolve towards completely digital libraries, they make efforts to provide information services with both hard copy as well as digital documents, which brings many challenges to most of the librarians, irrespective of their function in the system.

In India substantial number of library and information centres have initiated the digital library projects to establish it by procuring digital resources in the form of CD-ROM based databases, on line databases, on-line e-journals, on-line bibliographical databases, on-line indexes or by digitizing their own rare and valuable collection of archival importance. Many libraries are having rare manuscript with them, which are decaying due to poor maintenance and care. These documents need to be digitised carefully, which may protect its originality and kept in the form of CD-ROM. These resources may also be mounted on high power server for open access through out the world.

Now-a-days Digital Libraries and Digitisation are very important catch words in every aspect of life to preserve knowledge resources pertaining to the area of art and culture, education, science and technology (S & T), Library and Information Sciences, literature and humanities, media and entertainment, preservation

of cultural heritage and history. The notable institutions among these are National Informatics Centre, All India Institute of Medical Sciences (AIIMS) located in New Delhi, National Institute of Mental Health and Neuroscience in Bangalore, MGR University in Chennai, National Library, and Kolkata etc.

3.1 Traditional Knowledge Digital Library (TKDL)

India is endowed with immense traditional knowledge, which either undocumented or available in ancient classical and other literature, often inaccessible to the Information Managers and Patent Examiners. Documentation of this existing knowledge, available in the public domain, on various traditional system of medicine has become imperative to safeguard its sovereignty and protect it from being misused in patenting of non-original inventions. To address this problem of grave national concern, NISCAIR and the Department of Indian Systems of Medicine and Homeopathy (ISM&H) have entered into an agreement for establishing a Traditional Knowledge Digital Library (TKDL) on Ayurveda. NISACRE is the implementing agency for this project. Its responsibility include providing user friendly software, setting up of TKDL hardware and software platform data entry, digitizing images of Slokas, making Directory on Traditional Knowledge Resource Classification (TKRC), popularizing the database and hosting the database in web/ portal. TKDL will be available in English German, French, Spanish and Japanese since these languages account for more than 98 % of the international patent application. This will give legitimacy to the existing traditional knowledge and enable protection of such information from getting patented by the fly –by-night inventors acquiring patents on our traditional knowledge systems TKDL in the first phase targets Ayurveda. But as a whole it would encompass, in addition to Ayurveda, Siddha, Unani, Yoga, Naturopathy and Folklore medicine (NISCAIR, 2003).

Some burning example of patenting of Basmati Rice, Turmeric, and Neem by the USA was defended by the Government of India as the extensive production and medicinal use of Turmeric and Neem is on record since time immemorial.

3.2 National Science Library/ National Digital Library

National Science (Digital) Library is a comprehensive collection of Science & Technology publications in the country offering services on a national scale. It subscribes to almost all S & T periodicals and has over 1,80,000 bound volumes of books and periodicals. National Science Library has also an Electronic Library Division with a rich collection of more than 5,000 foreign journals, conference proceedings etc and a large number of databases including CA, CAB, SCI, Current Contents, Indian Standards and US Patents. It has been planned to digitize the NSL holdings and to facilitate storing of digitised information in the emerging electronic library environment, eventually converting NSL into National Science Digital Library (NSDL), which would serve as a model for other libraries throughout the country.

3.3 Digital Library Initiative at National Library of India, Kolkata

The National Library of India, which is controlled and managed by the Department of Culture, Ministry of Tourism and Culture, Government of India, has launched its centenary celebrations as it completed its 100 years of existence on January 30, 2003. In 1903 the Calcutta Public Library was merged with the Imperial Library to mark the beginning of the public library service in India at the national level. The National Library of India came into being in 1948 with the passing of the Imperial Library (Change of Name) Act. On February 1, 1953 the Union Education Minister Maulana Abul Kalam Azad in its present building formally opened it. This Library was perceived as a "library of reference, a working place for students and a repository of material for the future historians of India, in which, as far as possible, every work written about India, at any time, can be seen and read." With these objectives in mind, the National Library of India is beginning to transform itself and accept the challenges of the 21st century to serve a wider clientele with an extensive range of content on India, not only available within its repositories, but anywhere in the world.

The National Library serves as a permanent repository of all reading and information material produced in India and written by Indians and also about India written by foreign authors, wherever published in any language in the world. The Library also has a rich collection of publications in English and other European languages, as also in Chinese, Japanese, Arabic, and Persian etc. It has also a rich collection of Sanskrit, Persian, Arabic and Tamil manuscripts and rare books. A detailed outline of the National Library of India is available at: http://www.nlindia.org

Information and Communication Technologies have revolutionised access to knowledge resources all over the world. The traditional methods of collecting, storing, processing and accessing information have undergone a massive transformation. The growth of Virtual Libraries, Digital Libraries, Online Databases, Library and Information Networks and automated services throughout the world

3.4 Digital Handling of National Library Collections

National Library, Kolkata has initiated a mega project of digitisation of rare manuscripts, books, artifacts, paintings etc. in digital form. The digitised documents are saved in CD-ROM / DVD. For digitisation a very modern digital lab has been established and the work of digitisation has been given to a commercial firm, which is doing the job with the assistance from the in-house staff. This project is under progress and it this project is being funded by the Ministry of Culture, Govt. of India. In this way the rare library resources are being preserved and conserved by the National Library, Kolkata.

3.5 ETDs Initiative in India: Electronic Theses and Dissertation Project of INFLIBNET Centre, Ahmedabad

Theses and dissertations have long been regarded as the bedrock of graduate education. They are scholarly works that take years to research and to write. The research is guided by experts in the field and frequently funded by highly competitive scholarships and grants. As secondary sources of information, theses and dissertations are particularly useful to researchers in the humanities, where the written word carries more weight and ideas tend to remain current longer. However, the vast majority of these works languish in obscurity in college and university libraries and archives. The best way to bring this original research to light is to publish it electronically and to give students and researchers free and open access to these documents via the World Wide Web. While this is not a new idea, the concept of electronic theses and dissertations (ETDs) is gaining momentum on college and university campuses worldwide, as faculty, administrators, graduate students, and librarians realize the value of making this information more accessible. INFLIBNET hosts database of Bibliographic records of Ph.D. submitted to various universities in India consisting of 1,75,929 bibliographics records(on Dec 2005) submitted to about 200 universities in India starting from 1905.

In India also Universities and institutions of higher learning are playing an important role in generating and dissemination of new knowledge by carrying out research work in the concerned contemporary areas and producing Ph. D. theses as a unique and vital sources of information. Vijayakumar, Murthy and Khan (2004) in their paper have highlighted the importance of Electronic Theses and Dissertations for Indian Universities and presented a conceptual framework for initiating the digitisation and electronic publishing of Theses and dissertations produced in Indian Universities. While examining the various aspects of Electronic Theses and Dissertations (ETDs), they have discussed the format of ETDs, IT Infrastructure requirement in terms of hardware and software, role of faculty and review process, copyright issues, Indian initiatives and role played by the INFLIBNET in this regards. INFLIBNET also tried to take this initiative to national level and contributed for the preparation of 'UGC regulations for submission of ETDs and a 'Guidebook for Submission of Theses and Dessertations in Electronic Format' prepared by University Grants Commission which discusses Current Scenerio, Major Issues, Data Standards and Implementation Process.

3.6   Vidya Nidhi Projects

The Library and Information Science Department of Mysore University has taken up the ambitious project, which aims to create an online database of all doctoral theses and dissertations published by Indian Universities. Having successfully completed the pilot project sponsored by the Union Science and Technology Ministry's National Information System for Science and Technology (NISSAT), the university has begun work in July 2003 on the national task of digitizing around 30,000 theses in English and multiple Indian languages published every year by 300 Indian Universities and autonomous educational institutions. (The Hindu, July 25, 2003).

The Project Vidya Nidhi is funded by a $155,000 (Rs. 75 Lakhs) grants from the Ford Foundation spread over three years and is assisted by Microsoft in harnessing industry-standard tools such as Unicode (for handling non Roman scripts) and the web language, Extended Markup Languages (XML).

In the pilot stage, 200 theses of Mysore University, many in Kannada have been digitised and placed on the project's website www.vidynidhi.org.in for free access and download. A bibliographic database of over 40,000 records has also been created.

The project is a member of international library initiatives including the Networked Digital Library of Theses and Dissertations (www.ndltd.org). Together with Vidya Nidhi, they try to ensure that rich information resources such as academic theses that may not be able though conventional channels of publishing are made available for sharing worldwide, using the Internet as the driver (The Hindu, July 25 2003).

3.7   Institutional Repository (IR)

An Institutional Repository (IR) is a digital collection or archives of a universities intellectual output, which collect, organise, preserve and make accessible the knowledge generated by the universities and academic institutions to all.   Universities and other institutions are producing digital information base of their Ph.D. theses & dissertations, articles, reports, conference proceedings, Audio-Video records using Open Source software and making them available to their end users It also makes possible to give access to quality scholarship produced by the concerned universities and institutions to others throughout the world over the Internet. Premchand et. al., (2004) have highlighted in their paper the importance of Institutional repositories, Open Access Movement and use of OAI-PMH compliant software for creating institutional repositories. They also describes about the current development of Open Access Initiatives, Open Archive initiatives Protocol for Metadata Harvesting (OAI-PMH), which is an important infrastructure component for establishing institutional repositories. They also highlighted the role played by the INFLIBNET Centre for launching the project of Institutional Repositories where information will be kept in digital archives and access will be given to all free of cost.

4.0   Access of Scholarly Science and Technology Journals in India

Citation studies have shown the alarming fact that research published in Indian sources is poorly cited compared to research published in international journals. Low accessibility and circulation rates lead to obscurity of the research communicated in those journals. This may ultimately be translated into a failure to attract international funding and collaboration (Lalitha Kumari 2005). Rajasekhar (2003) explained that India's challenge is to reciprocate the information flow and improve access and thereby the impact of Indian research. To meet this challenge and to generate a national R&D resource base, an open access approach in line with the Budapest Open Access Initiative is being promoted. To achieve open access to scholarly journal literature, the initiative recommends the complementary strategies of self-archiving and open access journals (Arunachalam 2004b).

4.1   Self-Archiving

Researchers and scholars need tools and assistance in order to deposit their refereed journal articles in open electronic archives, a practice commonly called self-archiving. This is to achieve the goal of lifting these research communications from obscurity. A model has been proposed to set up interoperable institutional digital research repositories. By self-archiving and by adopting the interoperability framework, these institutional repositories are accessible via the Internet.

The first endeavor to be successfully implemented in this area is e-Prints, an institutional repository of research output from the premier Indian research institute, the Indian Institute of Science, Bangalore (http://eprints.iisc.ernet.in/). The archive is maintained by National Center for Science Information (NCSI) and it supports self-archiving by IISc's scientists of research publications in various file formats (PDF, MS-Word, HTML, etc.). This open access system facilitates seamless access, thereby increasing international visibility for this research. India, with its large R&D base of federally funded organizations, has a great potential for open access publishing (Rajshekar 2003).

4.2   Open Access Journals Initiatives by Scientific Societies / Scientific Publishers

A number of Indian publishers are taking advantage of the improved communication networks and technology to initiate an open access policy for their journals. These initiatives are happening as isolated efforts by both society and private publishers.

4.3   Indian Academy of Sciences: (http://www.ias.ac.in/)

The learned scientific society with its aim of promoting progress and upholding the cause of science in pure and applied branches publishes 11 journals in all front-line scientific disciplines. It has taken the lead in India in providing open access to Indian research by making available the electronic versions of its journals over the Internet. The Academy feels that open access to research literature achieves a quick impact and makes quality articles much more visible. Retrospective digitization of back files is complete and they are accessible. Unlike the open access journals of some of international publishers, the Indian Academy of Sciences does not charge authors for publishing their papers. Government funding and subscriptions to their print journals meet the cost of publishing.

4.4   Indian National Science Academy (http://www.insaindia.org/)

In order to strengthen the open archive movement at the national level, the Indian National Science Academy (INSA) proposed a project, "Building Digital Resources: Creating Facilities at INSA for Hosting S&T Journals Online." The National Information System for Science & Technology funds the project; it facilitated digitizing S&T journals published by INSA and hosting them on a web server. INSA wishes to promote a cadre of open access experts in Indian higher educational institutions and federally funded laboratories. INSA also encourages other professional societies having their own web sites to get a link on INSA's site to facilitate a single point of access.

4.5   BioLine International: (http://www.bioline.org.br/)

This is a collaborative initiative of scientists and librarians of the University of Toronto Libraries, Canada, Brazil, and Bioline, UK. It is a non-profit electronic publishing service committed to providing open access to quality bioscience research published in developing countries. It makes available published information from peer-reviewed journals from Brazil, Cuba, India, Indonesia, Kenya, South Africa, and Zimbabwe via the Internet. By 2005, the site will host 15 medical and bioscience journals digitized by Medknow Publications, Mumbai.

4.6　Indian MEDLARS Center: (http://indmed.nic.in/)

This is an initiative by the National Informatics Center (NIC) and Indian Council Of Medical Research (ICMR), two governmental agencies. The center has developed indMED, a bibliographic database of peer reviewed Indian biomedical journals. MedIND (http://medind.nic.in/) is the full-text archive for 28 peer-reviewed Indian Biomedical journals indexed in indMED.

4.7　NISCAIR (National Institute of Science Communication and Information Resources) Journals

This is an effort by the government-funded Council of Scientific and Industrial Research (CSIR) (http://www.niscom.res.in/ScienceCommunication). The publication wing of CSIR, NISCAIR, brings out 11 research journals in different S&T disciplines. Though full text is not currently available online, bibliographic information and abstracts can be accessed and searched. There are other isolated efforts from learned societies such as the Indian Statistical Association, which provides full text access of its journal SANKHYA (http://sankhya.isical.ac.in/)

5.　Digitisation of Important Indian Libraries

Shafi (2004) has described about the digitisation strategies being adopted by few important and famous libraries in India, which are as follows:

5.1　Khuda Baksh Oriental Public Library (www.kblibrray.org)

It is one of the Oriental Libraries having rich collection of Persian, Arabic, Urdu and other languages manuscripts. The descriptive catalogue is available in 30 volume set which appeared in 1923 and reprinted in seventies, besides other catalogues and publications compiled by different authorities. The Library has completed the job of converting manual catalogues into machine-readable form by the NICNET, which has undertaken the digitisation project. The information regarding the publications may be accessed from the web site hosted by the library. The link is given to the whole catalogue of documents available in the Library. The document is browsed as a JPEG files. It has not introduced any retrieval mechanism as the document is treated as collection of images files in JPEG format. The catalogue is not accessed under metadata or any useful descriptor.

5.2　Raza Library, Rampur, Uttar Pradesh (www.razalibrary.com).

This is also manuscript library which was developed under the patronage of " Nawabs" having a collection of 10,5000 Volumes. It has been recently appeared on the website with an interface for the manuscripts. It displays information of two manuscripts on a single screen giving brief bibliographic information in Roman form along with the folio of the manuscript scanned. The collection is limited to few manuscripts only. The search Engine is not used and digital library software is also not used.

5.3　Kashmir University Project (www.makhtootat.org)

The Department of Library and Information Science University of Srinagar, J & K has undertaken a project sponsored by UGC for designing a databases for designing a medieval manuscript available in Kashmir. This project is under progress and is made available accessible on web after proper training.

6.   Digitisation of Manuscripts and Rare Documents: North Eastern States Initiatives

The National Mission for Manuscripts has been established by the Department of Culture, Ministry of Tourism & Culture, Government of India which calls slogan " Save Manuscripts: Save the Past for the Future" (www.namami.nic.in). Under The National Mission for Manuscripts, Central Library of Guwahati University has initiated   a project for collecting the rare manuscripts and documents available in North Eastern Region and organise them for preservation and making a union catalogue of all these manuscripts and documents. The project will be completed and they are planning to initiate the process of digitisation for the preservation of such a valuable and rare collection available in this region, which would be a valuable collection in digital form for higher studies and research.

6.1   Proposal for Digitisation of Manuscript Available in Barak Valley: Initiative of Assam University Library

Barak Valley comprises of four District of South Assam viz. Silchar, Hailakandi, Karimganj and N.C. Hills. It is very remote area although it is well connected by air; rail and road but surface communication takes lot of time, which results in low socio-economic development of the region. For the up-liftment of the backward society in terms of Higher Education, Socio-economic development, Assam University, the Act of Parliament XIII of 1989 established a Central University. Then the long awaited university came into existence on 21st January 1994. At present Assam university has 27 academic departments, 3 study centres relating to Science & Technology, Social Sciences, Humanities and Language. Regional Engineering College (Now NIT) and Medical College have been established two decades back for the development of Barak Valley (Sinha, 2004A).

In Barak Valley people of various socio-economic strata comprising of Bengali, Maitai and Vishnupriya Manipuri, Naga, Barman, Dimasa, Tea garden workers came from various states like West Bengal, Bihar, Uttar Pradesh, Orrissa etc. are residing here since long. The society is multi-cultural society, which carries various cultural heritage, diversity, customs and traditions. Some of the local population and the repositories of Temple, Mosque, Churches and other religious organisation are having very ancient and rare manuscripts and documents with them which needs proper planning for their collection, organisation, conservation & preservation, digitisation of these documents and manuscripts for the present and future generation.

Assam University Library may take this project as a major task to collect all these documents form the personal archives of the local communities or religious organisations/ institutions, and preserve and digitise them for further research and development and future use. In this endeavor, grants from the UGC and National Mission for the Manuscripts, Department of Culture, Ministry of Culture and Tourism may be explored for the conservation and preservation of these rare documents and manuscripts scattered in this region of South Assam of North East India. I would like to request the Assam University authority to take necessary steps in this regards to save such a precious and rare information resources available in the form of manuscripts and hand written documents.

7.   Copyright Issue for Digitisation

Digital technology gives libraries an excellent opportunity to improve their services. It also provides new ways and means of preservation and dissemination of library collections. But the different stages of digitisation of library resources involve many copyright issues. The rights that come into play in the ordinary course in the digitisation of a work by a library are the rights of reproduction and adaptation. Reproduction includes the storing of a work in any medium by electronic means (Section 14 of the Copyright Act, 1957). Adaptation includes rearrangement or alteration in a work (Section 2 of the Copyright Act, 1957). During digitisation, sometimes rearrangements may have to be made in a work, which would attract the right of adaptation (James 2005).

Digitisation is the process of converting a work into a binary language that can be read by a computer. It involves storage in an electronic medium such as the hard disk of a computer or a floppy disk or a CD-ROM. The Copyright Act classifies such storage as reproduction. Hence digitisation involves reproduction, which is an exclusive right of the owner of the copyright in the work if the work is still in the copyright regime. Therefore, it is legal requirement that permission of the copyright owner is obtained before digitizing a work in the library on which copyright subsists.

Digitisation involves certain rearrangements and alterations because of technical reasons. Many a times it also involves such alterations for their reasons such as formatting, facility for searching and so on. If the work is in copyright regime, such things can be done only with the permission o the copyright owner.

Exploitation of a Digitised Work

Apart from further reproduction or copying, the most common exploitation of a work in the digital format are through issuing soft copy or hard copies of the work. When a library, after digitisation, issues such copies of the work to its members or others, not as lending, the right of issuing copies of the work comes into play. In that case, if done without permission of the copyright owner, it will mean infringement.

Uploading a work on Web Site

Once digitised, a work is capable of being exploited in numerous ways. Making the work available on a website is one of the common things. Putting the works on a website involves the right of communication to the public. This right is so comprehensive and overwhelming in the digital environment that it covers all communications on the Internet and Intranet. It is not necessary that another should have read the work kept on a websites. Keeping the work on the web sites itself become an act of communication to the public. Therefore, necessary permission should be obtained before putting any work on the web by a library, if the work in question is having copyright.

8. Manpower Training and Planning for Digital Library

Advanced manpower training and planning is necessary for the successful establishment and operation of Digital Library Projects. Venkata Rao and Sinha (2004 A) have elaborated the necessity of HRD issues for developing digital library. They pointed out that for development of digital library we have to develop human resources. Training and development of work force is the most essential instrument of Library Human Resources (LHR). INFLIBNET and other professional organisations are playing an important role for extending requisite manpower training to the IT workforce in Indian Universities and Institutions of higher learning. According to a survey carried out by the author himself for his Ph.D. work (Sinha, 2004 B) reveals the following findings:

- INFLIBNET   has emerged as one of the important agencies for organising maximum number of training programmes for library and information professionals, which has organised training for the 11134 professionals. Other agencies like NISSAT, INSDOC and DRTC have also organised training.

- Other agencies like ILA, IASLIC, UPLA, LELPRO, MALI, TLA etc are also arranging training for library professionals which may be school and college libraries, technical libraries, Govt. libraries, institutional libraries, public libraries which have not been included in the present study, therefore their percentage is less for university libraries.

9. Conclusion

Digital libraries are characterized by equitable access, reduced barrier of distance, timeliness, shared resources and content delivery. They can provide access to a large quantity of collections of primary and secondary documents. They can also support publicity and integration of new information. Besides this digital libraries offer greater opportunities for users to deposit and use information. The digital library can also help and organise printed works in to a universal library and thus provide access to it from anywhere in the world. There is limitation of digital library in archiving and preserving of digital resources. Unlike paper media electronic media become obsolete and degraded at faster rate. Therefore long time preservation strategy is formulated to preserve digital resources for future use.

The prospects for digitisation of rare documents & manuscripts and establishment of institutional repositories of North Eastern States should be explored at the higher level and university libraries of this region should come forward to make a Joint Working Group for taking initiatives in establishing and coordinating the digital library projects in this region.

10. Acknowledgement

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