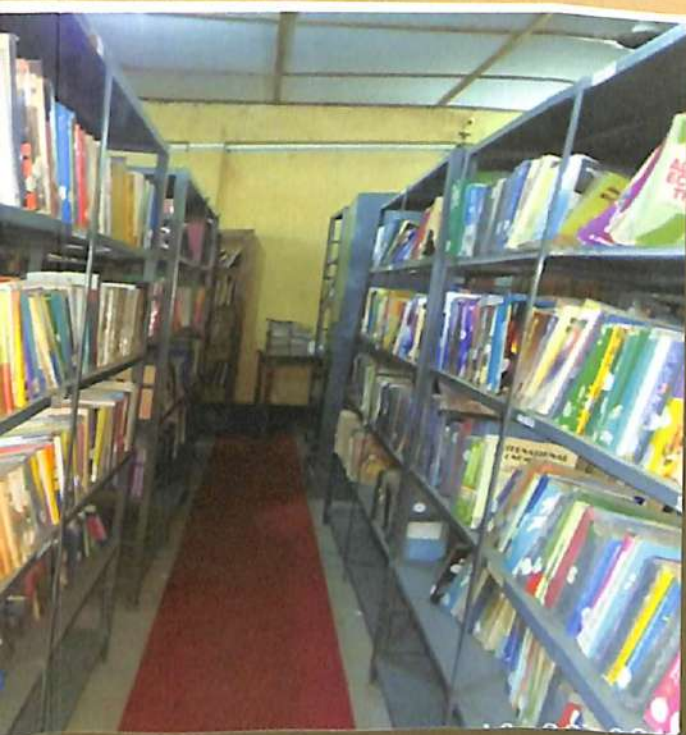


MODERN TRENDS AND SERVICES OF LIBRARIES IN DIGITAL ERA



Edited by
JULI THAKURIA

**MODERN TRENDS AND SERVICES
OF LIBRARIES IN DIGITAL ERA**

Edited by-

Juli Thakuria

Dr. Birinchi Kumar Barooah College
Puranigudam, Nagaon

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Preface

Geographical distance is not a barrier now and the society is availing maximum benefits of the services of the library establishment mainly because of use of ICT devices. Libraries in general and academic libraries in particular are encountering a great deal of change in recent years. Users now have multiple options to meet their information requirement. As such, before approaching the library for his/her information requirement, a user would have already explored web-based information sources.

At present libraries are having different formats and developing their collection manually or electronically. Born digital items are continuously growing in the collection through subscription as well as available from open sources. Moreover individual libraries are to initiate in-house digitization for better preservation and easy retrieval of available resources.

This volume includes eleven papers focused on a wide variety of issues including Academic Library, Digital Library, Institutional Repository, Information Literacy, Resource Discovery Tools, Virtual Reference Service, E-resources etc.

As the editor, I wish to express my sincere gratitude to the Principal Dr. Bhupen Saikia, Dr. Kamal Ch. Saikia, Dipa

Thakuria, all the members of my college including my library staff and my family members for their help and support to compile and publish this volume.

I would like to beg apology for any unintentional mistakes that might have occurred in the work.

I acknowledge with thanks to the contributors of this volume and Ajanta Press, Nagaon for completing the printing works in time.

October 27, 2017

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Building Institutional Repositories: Issues and Challenges

Narendra Lahkar

Introduction

Library is a place where collection of resources, their organization, dissemination and preservation has been taken place. Accessing information in different formats is being facilitated by the library and is recognized as prime factor the society needs for development. Information society or knowledge society has the credit in transforming the library to a knowledge centre. Providing resources for research, aiding researchers to make them aware on the present scenario of development and help in widening the horizon of knowledge are some of the basic components a knowledge centre is extending. The centre brings together the resources and the users/ scholars. In the changing trends of developing society, libraries, the knowledge centres have become the basic requirement in order to continue for further development.

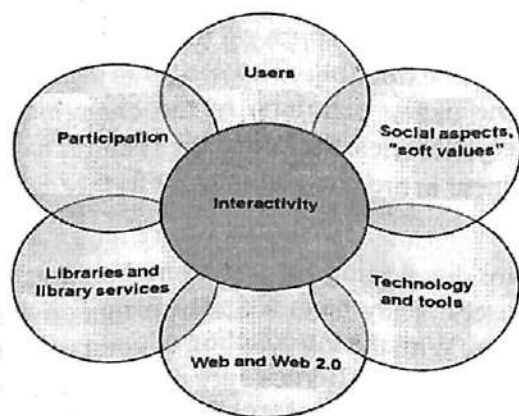
Libraries 2.0

Libraries are developing for providing better and advance services to the users. They have changed from conventional to automated libraries. With the introduction of computer to perform various jobs and services the libraries are regarded as information centers and a knowledge centers. Information technology development and its use in library establishment have lead the

situation to a most advanced stage and the libraries are extending services in globally instead of confining to the four walls. The concept users should come to the library to avail its services has changed in the present environment rather library has to go to the users became the order in today's context. Library 2.0 is the user-centered model where in users' participation in building library collection, organization is found to be more significant. In addition to the physical services a library is extending, virtual services are also the way users are availing from the library.

The online document delivery, OPAC interface/ services in intranet and internet mode, document alert, renew/ reservation remotely, virtual references, and other related facilities/ services has made the library a place with no barrier/ geographical constraints. It is to be mentioned that web 2.0 technologies have facilitated to keep up as per our desire in changing the library to a new height and the libraries became more user oriented meeting varied needs of users in different forms and formats. Technology advancement has played the role to perform library jobs in better way improving the ability of the libraries significantly.

Figure: Library 2.0



(<http://www.google.co.in/imgres.....>)

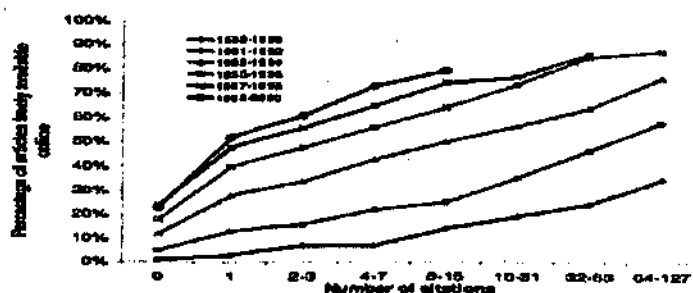
Open Source Software (OSS)

Open source software is available in open forum through internet access with the source code usually with no costs. Besides source code, the software requires some other basic programmes generally available also open. Availability of open source software in different disciplines including LIS has given momentum for reaching new height in various direction and new opportunities are being evaluated by the researchers by using the OSS. OSS is generally available free and additional license for the programme is not necessary for every computer it is installed. OSS is not only required no/ less cost in installation than the proprietary software but also less in post installation while working with the package.

Required criteria to be considered in case of OSS are:

- Free distribution of the package/ License;
- Source code to be made available without any or with minimal restrictions;
- Provision of modification of the works be allowed in the License;
- Integrity of the author's source coded;
- No discrimination against individuals and group;
- License not to restrict on the use of other sources;
- License is to be technology neutral.

Figure: Open access increases impact



Nature, vol. 411, No. 6837 (2001) p. 521

There are important advantages of using OSS:

- It enables to a large numbers of developers to enhance the product and redistribute it;
- The source software is much more flexible;
- Reduce acquisition expenses. Proprietary software costs are considerably greater than individuals of open source software. Actually, in the majority of cases, open source software is free of charge and expenses for documentation and assistance are very reasonable;
- No need to be worried about permit. We can set up the software several times and can be utilized it everywhere;
- Open Source Software allows easy debugging thanks to access to source code.

We can obtain a great deal of advice from many software users and developers as the same is used by big community;

We can choose from plenty of software providers anytime we want. Open source code makes impossible for one vendor to see himself as one just provider and then take advantage of this case.

(Source: <http://www.monwe.com/top-7-advantages...>)

Table: List of LIS OSS Packages

Table: List of LIS OSS Packages			
1	ADLIB Information Systems	34	Libertoy
2	Access-It Software Ltd	35	Library Concepts
3	Acumen & Scope e-Library	36	Library Technology Guides
4	Andrew Osborne's Library	37	LibraryCom
5	Automation Pages	38	LibraryTools.com
6	Auto-Graphics, Inc	39	MC2 Systems library
7	Autolib Library and Information Management Systems	40	Mandarin Library Automation, Inc
8	Automation Trends: ARL Libraries	41	Minisis
9	Bailey Solutions Ltd	42	Neuton Data Systems
10	BiblioMondo Inc	43	New Generation Technologies Inc
11	Book Systems, Inc	44	Open DLib
12	BookWhere	45	Open Source Schools
13	CDS/ISIS Database Software	46	Open Source Software and Libraries Bibliography

14	Cadomel Library Management Systems	47	Open Source Systems for Libraries News (OSS4Lib)
15	Church Related Online Software Systems (CROSS Systems)	48	OpenBiblio
16	Digital Library eXtension Service	49	OpenSiteSearch
17	EOS International Library Automation	50	PMB Services
18	Elvis Digital Library (ElvisDL)	51	Perpustakaan Library Software
19	Evergreen	52	Public-Library.com
20	Ex Libris	53	Pustaka
21	Ex-Libris	54	Remote User Authentication in Libraries
22	Fedora: Flexible Extensible Digital Object and Repository	55	ResourceMate
23	Follett Software	56	Ringgold
24	Geac Library Solutions	57	SorsoDynix
25	Greenstone	58	Surpass Software
26	IS Oxford	59	Talis
27	Innovative Interfaces Inc	60	Tapir for DSpace
28	KLAS, Keystone Library Automation System	61	The Library Corporation (TLC)
29	Katipo Communications	62	VTLS, Inc
30	Knowledge Integration Ltd	63	Virtual Data Center (VDC)
31	Lending Library Software	64	Course/control
32	Libdata.com	65	iBookshelf
33	Libero		
Source: http://www.dmoz.org ..			

Open source softwares are computer software, developed by group of programmers with a collaborative effort.

Project for open sources are undertaken by large number of programmers; all involved initiating, developing, in a web based environment. On the contrary commercial software uses proprietary system as the framework for the websites they create. OSS means a package created by handful of developers. It promotes software reliability and quality by supporting independent peer review and rapid evolution of source code. A proprietary solution cannot compare to that of open source.

Closed-source (or commercial) software forces its users to trust the vendor when claims are made for qualities such as

security, freedom from vulnerabilities, adherence to standards and flexibility in the face of future changes. If the source code is not publicly available those claims remain simply claims. By publishing the source code, authors make it possible for users of the software to have confidence that there is a basis for those claims.

(Source: <http://webdevstudios.com/support/faq/why-use-open-source-software/>)

The following are a list of the advantages of opting for OSS:

- ◆ Less hardware costs;
- ◆ High-quality software;
- ◆ No vendor lock-in
- ◆ Integrated management;
- ◆ Simple license management;
- ◆ Lower software costs;
- ◆ Abundant support;
- ◆ Scaling and consolidating

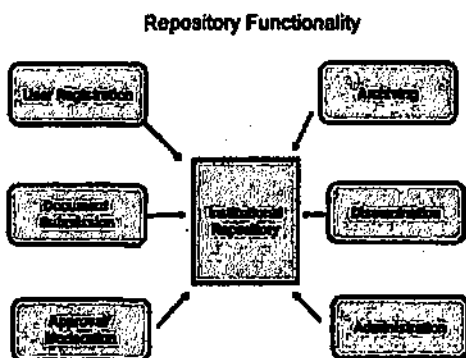
(<http://www.outsource2india.com/software...>)

Today open source software has been used by almost every organization; due to its various advantages. Be it telecommunication systems, accounting, IR, LIS, all organizations are looking after OSS for performing their day to day jobs and in recent years.

Institutional Repositories (IR)

Institutional repository is the digital collection or archives of digital items of an institution (generally of higher learning) collected, organized, indexed and archived facilitating access to the academics of the institution in and outside. Universities and colleges and other R & D Institutions as a body or individuals are producing written records especially in digital formats like reports, theses, dissertations, articles, etc. These are to be made available to others with proper planning. An IR may contain items of which the copyright is with the author or the institutions or permission is obtained by the institutions for its inclusion from the authority and to exclude those items of not having the permission to include.

Figure: Repository: functionality



Narayana, Poornima: Institutional Repositories: An Effective Scholarly Communication Channel (www.icast.org.in/nsobir/...)

The OSS for creating, developing IR can be freely used, copied, studied, modified, and redistributed by everyone that obtains a copy: free software OSS; this means software which is distributed with a free software license and the source code is available to anyone who receives a copy of the software. IR software is typically web-based and serves as the backend for specific databases.

Table: Institutional Repositories in India

1	Digital Repository of IIT Bombay	12	Prints@IISc
2	DRS@ins	13	ePrints@Catalysis
3	DSpace@NITR	14	ePrints@SBTMKU
4	DSpace@MDI	15	Indian Institute of Astrophysics Repository
5	DSpace at Indian Institute of Management Kozhikode	16	Institutional Repository of National Aerospace Laboratories
6	DSpace at National Chemical Laboratory, Pune	17	Kautilya Digital Repository of IGIDR
7	DSpace@INFLIBNET (Accessible sometimes)	18	NISCAIR Online Periodicals Repository
8	Digital Collection@INFLIBNET Centre	19	RRJ Digital Repository (Raman Research Institute Digital Repository)
9	ePrints@SVNIT (Sardar Vallabhbhai National Institute of Technology)	20	NISCAIR Online Periodicals Repository
10	eGyanKosh- (It needs registration)	21	OpenMED@NIC
11	Prints@IIT Delhi		

Source: <http://key2information.blogspot.in/2008/12/institutional...> accessed 10.03.2012

Why of Institutional Repository

It is rather a necessity to show others on the literary output

of one institution to make visible of the works done by an institutions and its community. Electronic output can be easily make visible by creating an IR of the specific institutions and accessible through net. Contributions made by the experts, if these are made known to others; can be base for further study and research, or otherwise, there is the possibility of duplication of works. At the initial stage, it seems to be costly, but in the long run the work will be certainly cost effective and less cost will be necessary for its continuous development. It is important that once an IR is created, it is to be regularly updated to become a proper base for information access, study and research. Moreover, as the repository is used through online mode, contents will be automatically linked with the related areas which are taken by researchers for furthering the growth. Once contents are in IR and put on to web, time lag between publishing and the recipients is minimize to almost zero level. As stated, IR brings visibility to the product of researchers i.e. of knowledge creator to the students, faculties, experts, authorities, the works add to the prestige of the LIS professionals.

Constraints of Institutional Repository

A policy in developing IR for individual institution is found to be missing either at institutional or Government levels. This has created to some extent a void situation in visualizing the literary/ research output. Though we are taking active part in all deliberations and discussions highlighting the importance of IR, in practice we are far backward and little step is given in creating IR of respective institutions. Either we are indifferent or lack expertise. Besides, fund is also a constraint in this direction. The environment we are surrounded by is not at par, infrastructure physical and electrical is not conducive and above all the authorities are not sufficiently aware on the benefits of such a project towards their people working for the organizing. Lack of awareness of the beneficiaries is also a major hindrance towards creation of an IR in particular institution.

Repository Packages

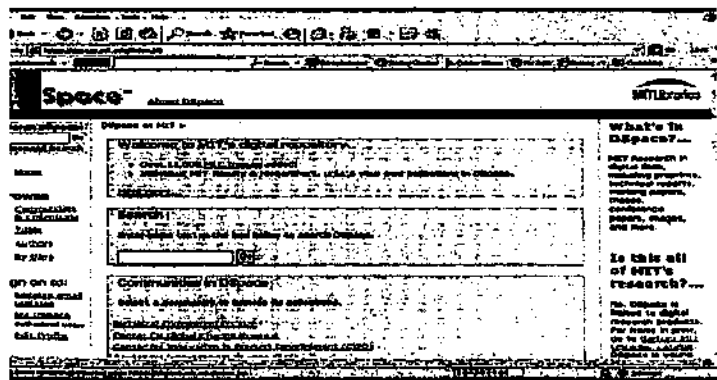
Both open and proprietary software are available in the IR world. They have their relative advantages and disadvantages. DSpace is one most used IR OSS. Due to its various advantages on creating databases and easy access using different IRS models, the use of DSpace is increasing remarkably. Of course, Eprints and Fedora are also easy for use inviting attention to a large extent from the LIS and IT professionals. The proprietary Software for IR like Digital Commons and SimpleDS are also being used. We will experience of such packages in near future as the area is very much of interest for the developer with the main goal of making visible of the intellectual output to the academic and research communities.

Table: List of Repository packages

1	DSpace		Hosted Proprietary SW Services'
2	Eprints	4	Digital Commons
3	Fedora	5	SimpleDS

Source <http://en.wikipedia.org/wiki..>

Homepage of an IR using DSpace



Conclusion

The OSS for IR like DSpace has emerged as a source for

the information collectors and information seekers. The package can extensively be used for the implementation of IR in institutions for developing and accessing of the documents. IR is fully on digital items and if the documents in questions are not in digital format, they are to be digitized prior to the IR. In that case, a formal digitization process has to be adopted by the institutions covering different aspects like HW and SW, selection of items to digitized, file format, scanning tools, OCR etc.

DSpace is free open source software can be downloadable from <http://www.dspace.org>. To capture, store, index, preserve and redistribute the intellectual output of digital assets, DSpace is the most used and popular OSS.

A well defined policy for creating IR by the institutions, specially the institutions of higher learning and R & D institution is necessary. In India, Centres like INFLIBNET, CSIR and AICTE are to coordinate and exercise each other for bringing out such a policy. ♦

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Visva-Bharati Library Network and Its Institutional Repository

Koushik Ghosh

Abstract : This article discusses on general concepts on Institutional Repository (IR) and its concept, needs, benefits and Indian scenario at present. It reiterates some earlier studies on IR. It tries to focus the spotlight on procedure to create the Institutional Repository through WINISIS, GENISIS web and Apache Web server software. This article shows how practically the Visva-Bharati Library Network is maintaining their repository by with technical details. It claims that this procedure is good enough and will be helpful to all libraries those are trying to create their Institutional Repository (IR).

Keywords : Institutional Repository; Apache; GENISIS; Open Source Software; Visva-Bharati Library Network; Winisis.

1. Introduction

It is a bare fact that the digital environment in all areas is a major determinant of development. Similarly, it is also true with Library & Information Science principles, practices and applications. The digital environment provides a conducive environment for facilitating fast and visible progress in the services, products and delivery mechanism. The gap existing between economy and the society is bridged with the help of the digital environment in short span of time. One of the major components

of the digital environment is Institutional Repository (IR) which has been in discussion and debated at professional platforms by the librarians, information scientists, academicians and administrators to drive maximum tangible benefits for achieving excellence in their respective areas. The effect of digital environment is more visible in Library and Information Centers globally as the libraries currently are not treated as the storehouse of books but considered as a gateway of knowledge resources, and the centre of creation and recreation of academic activities. It is further added that the knowledge has been recorded in various forms starting from clay tablets to papyrus, scrolls, paintings, rock scripting and modern chip technology. The ancient scholars who produce the body of knowledge kept it secret from others for centuries. The Vedas in India, which are considered as the storehouse of knowledge, were not accessible to almost seventy five percent of the population in the ancient time. Even today, the nuclear energy information is not accessible to all the people. Likewise books and other knowledge become an individual's possession and are denied to the rest of the people.

Public libraries have emerged and developed with the sole concept of democratizing the knowledge. The developed countries have control over mass media and have monopolized the means and the medium of knowledge dissemination. The big publishing houses are controlling the research and its publications all over world. The developing countries due to the financial crunch are not able to sustain their knowledge centers. Most people would like to have things free of cost. It is human nature. The habit or desire to have things free has developed into a full-scale subject of concern and the solutions are being searched to find out the human desire to access knowledge free of cost. Institutional Repository is an answer to the thrust of knowledge especially for those who have been deprived of it due to a number of reasons. The process of empowering the faculty and researchers through knowledge sharing in form of IR in recent time has taken a big leap (Kalbande, 2012).

2. Concept of Institutional Repository (IR)

An IR is a system in which a common consensus is developed among common interest oriented persons to share their contributions that are in their possession in form of articles, research papers etc. It is considered the wealth of everybody among such group. The contributor loses her/his claim over the knowledge once he/she has contributed the article thereby making it available to those who are in need of the related knowledge. The recipients are benefited by the quality literature of eminent writers by paying nothing and violating no rule of any land. In this way an Institutional Repository is a continuous amalgamation of various activities including contributing articles, communicating to the repository and participating in building the IR.

Lynch Clifford (2003) expresses his views on Institutional Repository, "a university-based institutional repository is a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation access or distribution." The crucial word Lynch uses here is "community". The term institutional repository implies a community based service although repository developers interpret this in different ways (Kalbande, 2012).

3. Needs of Institutional Repository

Since India is coming out from the shadows of backwardness and the agony of LDC i.e Less Developed Country, it is needed that the support for her nourishment must come from all corners of the intellectual society. The shrinking budgetary support, increasing cost of reading material and the mind set and attitudinal patterns of the managers in institution of higher learning clearly indicate that some alternatives to meet these challenges have to be found out. Institutional Repository should be renamed as "Intellectual Repository" as it is more appropriate and

comprehensive term. It is through this system that quality of intellectual output can be measured since till now there is no quality measurement method for the publishers and contributors. Therefore, there is a great need of such Institutional repositories in institutions of higher learning so that a network of intellectual repository access can be explored (Kalbande, 2012).

4. Benefits of Institutional Repository

Following are the important benefits of IR:

1. The institutional repository model provides a means for institutions to create archives and make available their wealth of knowledge. It allows individuals (scientists and researchers) to self-archive their own material.
2. For the individuals the institutional repository acts as a central archive for their work, representing a CV that provides a complete list of their research over the years. Because it is open access, it increases the dissemination and impact of their work.
3. For institutions it acts to preserve their intellectual wealth. It increases their visibility and prestige, and can act as an advertisement for funding sources and industrial sponsors.
4. For society it provides access to the world's research and ensures the long term preservation of research (D, 2003).

5. IR Initiatives in Indian Scenario

India is not lacking behind in building Institutional repositories because many premier's institutions like IITs, IIMs, IISc and many Universities have already taken the initiative of IR. The various government and professional bodies are also involved to help these institutions and universities for building intellectual repositories. The Government of India has setup the Knowledge Commission (KC) to prepare a clear cut road map for the institutions of higher learning in India for taking the initiative like up-gradation of libraries and building Institutional Repository. Similarly, The University Grant

Commission, (UGC) has already setup a separate agency namely Information Library Network (INFLIBNET) with the objective of modernization of libraries and setting up knowledge centers for accessing and sharing the vast knowledge of research. The INFLIBNET is providing the specialized training and networking of libraries among its member institutions and universities for selecting, managing, preserving and disseminating scholarly materials. Some professional associations and societies like Developing Library Network (DELNET); Society for Advancement of Library & Information Science (SALIS) and Indian Library Association (ILA); Bengal Library Association (BLA) are also involved in modernization of libraries, training and setting up the IRs.

6. Genesis of Visva-Bharati Library

Maharshi Devendranath Tagore founded Santiniketan Asrama in 1863. When he passed through this place two years earlier and took rest under a couple of Chhatim (Saptaparna) trees, he felt a strange calm and elation. Consequently he purchased some land and named the place Santiniketan (Abode of Peace).

A small library also started functioning in a room of Santiniketan House from October 1888. Rabindranath wrote so on the issue, the collection of our revered father's books were kept in one of the three rooms. We first looked after the proper preservation of books and manuscripts. After the establishment of Brahmacharya Asrama by Rabindranath Tagore on 22 December 1901, Tagore built up his Asrama Library with his vast personal collection. The library grew along with the development of Brahmacharya Asrama under great care of Tagore. Tagore's biographer Prabhat Kumar Mukhopadhaya (1892-1985) was entrusted with the responsibility of the Asrama Library in July 1910.

On 23 December 1921 Tagore formally started a college (Visva-Bharati) with proceeds from the prize money of the Noble Prize he received in 1913. As a result scholars from different

parts of the world joined as faculty and Visva-Bharati library started receiving good number of books as gift. Visva-Bharati Annual Report 1921-22 referred so to the Library: The library at Santiniketan is one of the special features of Visva-Bharati. The library possesses a good collection of books on Sanskrit, Pali and Prakrit, a valuable collection of Chinese and Tibetan books. The Indian vernaculars are well presented specially Bengali, Hindi and Gujrati. It also contains a very unique collection of books on Indology and Art, chiefly in French and German. Over the years, along with the creation of different Bhavanas, Bhavana libraries emerged.

Rabindranath passed away on 7 August 1941. The collection of his priceless books, paintings, manuscripts, archives and other objects of value treasured by his son Rathindranath were handed over to Visva-Bharati. On 14 May 1951, the Parliament of India by Visva-Bharati Act 1951 (Act 29 of 1951) declared Visva-Bharati as an institution of national importance and a unitary, teaching and residential Central University. The Visva- Bharati Library stationed at Patha Bhavana was, subsequently, renamed as Central Library. The Central Library was shifted to its present location in December 1971. An annex to this was added on 23 December 2013.

6.1 Central Library

The Central Library has today 3, 76,531 volumes of books, around 9,000 members and a daily transaction of 300 books. The library has a number of important collections; mention may be made of the collections of Prabodhchandra Bagchi, Pramatha Choudhuri, Humayun Kabir, Satikumar Chattopadhyay, Lila Ray, Ashok Rudra and Abanindranath Tagore.

The important service points of the Central Library are a) Reference Section (including the Reading Room for text books and Career Counseling Corner), b) Periodical Section (including the computer kiosk), c) Circulation Section and d) Technical Section.

The Central Library of Visva-Bharati remains open from 7 am to 8 pm throughout the year on all normal working days. On Sundays, Wednesdays (weekly off) and holidays it is open from 10 am to 5 pm. The automation as well as networking of libraries is done on LibSys 7 software, which manages the database of its entire collections of 8 lakh documents including e-books, digitized books, theses etc. and all transactions. The institutional repository is mounted on DSpace & it will discuss later in details.

6.2 Visva-Bharati Library Network

The Visva-Bharati Library Network, today, comprises of Central Library, 12 Sectional Libraries and 30 Seminar Libraries. It caters to the needs of around 9000 users. The libraries hold a cumulative collection of more than 8 lakhs print resources and provide access to about 1, 40,000 e-resources (including 9000 e-journals). The routine services of all the libraries have been fully automated and networked using the library database management software 'LibSys' version 7 (Unicode compatible).

The important resources of the Network are: Journals (online and print), books (print & electronic), digitized books, theses, and online databases (J-Gate, JStor, IndiaStat, ISID, Web of Science, RSC Databases etc).

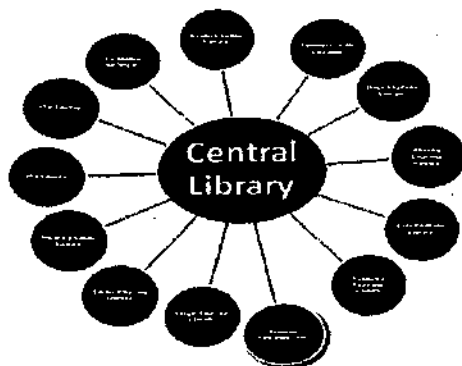
The various services rendered by the libraries, besides lending, and reference services, are: Current Awareness Service, New Arrival Alert, Newspaper Clipping Service, Bibliography Service, Inter Library Loan (ILL), Braille Library Service (2 units) etc.

The Library is part of the Visva-Bharati Library Network and is connected to the Central Library through the campus wide Optical Fibre Network. The services that are available to the users through this network are:

1. Union catalogue of documents of all libraries in the network (WebOPAC: <http://14.139.211.2:8380/opac/>),
2. Integrated automation through LibSys software,
3. Access to digital, electronic resources like online journals & databases, e-books, digitised books, theses

4. Information services like Newspaper Clipping, CAS, Scholarship update, New Arrivals, Institutional Repository consisting of syllabuses and question papers, IT-enabled services like access to plagiarism detection software (Urkund: <http://www.urbund.com>), remote access facility (OpenAthens: www.openathens.net/), Single Window Search Engine (Discovery Service: <http://search.ebscohost.com>), Web of Science, JGate+, EndNote etc
5. Library Website: Gateway to everything about the Library: <http://14.139.211.2/library/index.php>
6. Inter - Library Loan System (DELNET)
7. Braille Library Service
8. Network e-Newsletter

Networking of libraries means sharing of databases, resources, hardware and software by constituent libraries and switching all interconnected with communication channels. The libraries at Visva-Bharati, though located at various places in the two campuses, function virtually as a single unit using a single software, single catalogue database (Web OPAC), and single server and sharing of all resources channelled through the single location (server) at Central Library. The constituents of the Network are the Central Library, 12 Sectional (Bhavana) Libraries and 30 Seminar Libraries.



Visva-Bharati Library Network

6.3 Institutional Repository of Visva-Bharati Library Network

Regarding creation of Institutional Repository in Visva-Bharati University, University Librarian depends on supporting staff and entrusted one staff member for the creation and enrichment of IR. The University Librarian has taken some positive steps for developing IR in the following way:

- a) Issued request letters to all Deans and Head of the Departments for depositing published journal articles, book chapters, etc. of all faculty members;
- b) Circulated request through library homepage;
- c) Posted e-mail to individual faculty members;
- d) Discussed in the meeting of the Library Committee; and
- e) Requested personally to Deans, Head of the Departments and faculty members.

But the response from the faculty members at a time is not very high but the IR of Visva-Bharati University Library is increasing day by day. The University Library is trying to create its digital repository with the help of library supporting staff as it is seen other university libraries. Some eminent librarians have conducted some studies on IR where they have the same experiences like Visva-Bharati University Library. In their studies they presented that university librarians with the help of other support staff are harvesting or otherwise mediating deposits, including technical reports, conference papers, student theses and dissertations, images, and non-scholarly publications into their university digital depository. Here, Visva-Bharati Library Network is using WINISIS, GENISIS and Apache Web server to create their digital repository. Digital repository of VBLN has three parts: a) Research products of faculties and others, b) Question Bank by digitizing question papers and c) Syllabuses of Visva-Bharati at a glance.

Main objectives of the VBLN IR are:

- a) To analyze the digitization procedure of university question papers,

- b) To analyze the digitization procedure of university syllabuses,
- c) To use open source software for the digitization,
- d) To use open source software for the browsing purposes,
- e) To extend library services throughout university campus as well as outside campus.

The basic purpose of this paper is to describe the steps how to create the digital repository of question papers and syllabus of Visva-Bharati Library Network with the help of open source WINISIS and GENISIS and the Extension of quick library services throughout university campus (Nandi & Mazumdar, 2005).

6.4 About WINISIS

WINISIS has developed by UNESCO (UNESCO, 2004), is a flexible, easy to use, menu-driven and to be used for generalized information storage and retrieval software. The software is designed specifically for creating and managing non-numerical textual databases. WINISIS has capability to create any number of databases with completely different data elements. WINISIS application can be used by anyone having a reasonable computer experience.

6.4.1 Components of WINISIS Database

WINISIS database comprises of a set of records and each record contains a set of fields such as year, course, subject, part, paper, etc. A field in a record is a container of data elements. WINISIS database has a master file containing all the records of the database. An inverted file functions as an index to the master file for faster access to any record. In order to create a WINISIS database of question papers of Visva-Bharati Library Network with any chosen fields, we need to define the following components.

Field Definition Table (FDT): The FDT defines the fields such as Year, Course, Subject, part, paper etc. of the records in the database and their characteristics. FDT determines the nature of data entry worksheet. Contents of FDT are preceded by the

name and tag of the fields that are defined in the FDT table which are to be found in Figure 1.

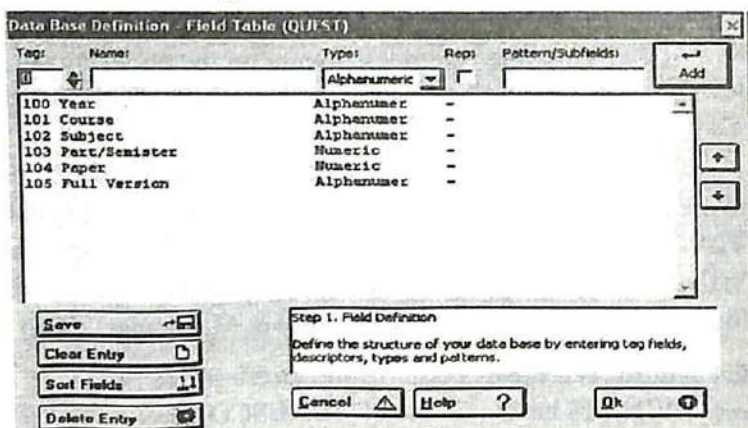


Fig-1: Contents of FDT

Data Entry Worksheet(s): The worksheet is the screen layout used to create and/or update the records of the database. WINISIS provides a specially designed editor to create the worksheet and with this we have created records of our database detail of which are to be found in Fig-2.

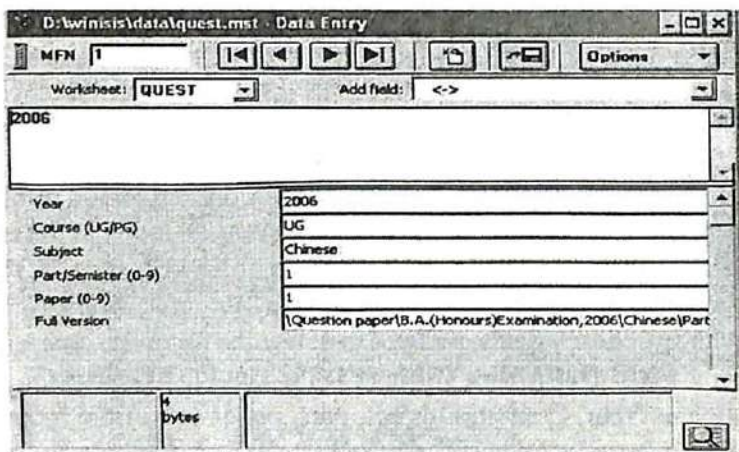


Fig-2: Data Entry Worksheet used to create records and database

Print Format (PFT) : The PFT is the format for display or printing of records. In the print format lines, we add the following formatting line in order to create a hypertext link with the words **Click Here** that will be connected to the full path, providing the tag 105. The command is very simple: **Link ('Click here'), 'OEPNFILE ', v105)** and this is to be found in Fig-3.

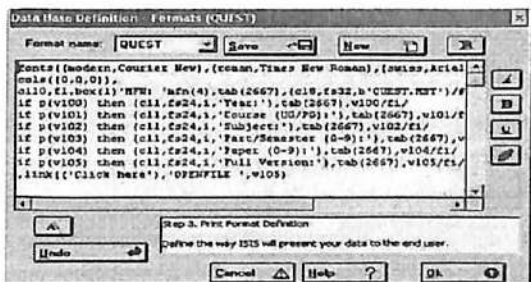


Fig-3: PFT format for display or printing of records

Field Selection Table(s) (FST) : This command opens the internal FST Editor. FST files define the way the content of the database is indexed and searchable. These rules, built up using the CDS/ISIS print formatting language, extract the searchable terms of the inverted file (dictionary of terms). FST defines fields that can be searched in the database. Search is made possible by creating an inverted file of terms indexed from the fields chosen for search as shown in Fig-4.

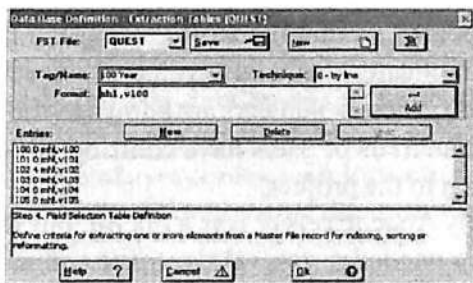


Fig-4: FST defined fields chosen for searching the database

Entering Data in the Database

We have tried to enter the data of all the documents of our digital collection. For the purpose the full path of the full text documents including extension (.pdf, .doc etc.) have been entered in the

Full Version field and the detail can be estimated in Fig-5.

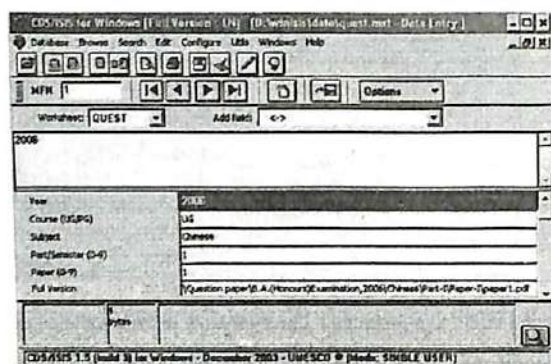


Fig-5: Entry path of the full text documents in the Full Version field

6.5 About Apache

The Apache Project is a collaborative software development effort aimed at creating a robust, commercial-grade, featureful and freely-available source code implementation of an HTTP (Web) server. The project is jointly managed by a group of volunteers located around the world, using the Internet and the Web to communicate, plan, and develop the server and its related documentation. These volunteers are known as the Apache Group. In addition, hundreds of users have contributed ideas, code, and documentation to the project.

The early Apache server was a big hit, but we all knew that the code base needed a general overhaul and redesign. During May-June 1995, while Rob Hartill and the rest of the group focused on implementing new features for 0.7.x (like pre-forked child

processes) and supporting the rapidly growing Apache user community, Robert Thau designed a new server architecture (code-named Shambhala) which included a modular structure and API for better extensibility, pool-based memory allocation, and an adaptive pre-forking process model. The group switched to this new server base in July and added the features from 0.7.x, resulting in Apache 0.8.8 (and its brethren) in August.

The Apache Software Foundation exists to provide organizational, legal, and financial support for the Apache open-source software projects. Founded in June 1999 by the Apache Group, the Foundation has been incorporated as a membership-based, not-for-profit corporation in order to ensure that the Apache projects continue to exist beyond the participation of individual volunteers, to enable contributions of intellectual property and funds on a sound basis, and to provide a vehicle for limiting legal exposure while participating in open-source software projects (The Apache HTTP Server Project, 2002)

6.6 About GENISIS

We have used the latest version GENISISWEB 3.0.0 (Talagala, 2003) for this manual. It is really admirable the assistance rendered by UNERSCO for the developing countries in the development of Library Information Services. GENISIS was originally developed by the former IBISCUS Association (France) for UNESCO and it is now available free of charge on the UNESCO FTP site. The software is written in Microsoft Visual Basic. Its source code is also freely available. A new release of GENISIS, the authoring software for visually producing search interfaces for WINISIS databases, is now distributed on UNESCO's WINISIS webpage. GENISIS is authoring software (for Win32) for visually producing web forms to query WINISIS databases. There are two versions of the tool: GenisisWeb, for web publishing and GenisisCD for developing CD Rom interfaces for WINISIS databases. WINISIS is advanced non-numerical information storage and retrieval software developed by UNESCO

since 1985 to satisfy the need expressed by many institutions, especially in developing countries, to be able to streamline their information processing activities by using modern (and relatively inexpensive) technologies. GENESIS, basically implements the following steps:

1. The web query form (with field selection and index access);
2. The display of query results;
3. The display of a particular record's details;
4. Test the application;

6.7 Software Requirement

1. WINISIS
2. GENESIS
3. Apache Web Server

After installation of GENESIS then clicking on the tab "APPLICATION" and then we get a dropdown menu. On the dropdown menu if we clicking on "New" and we will get the dialog box where we have to select an existing WINISIS database like the Fig-6.

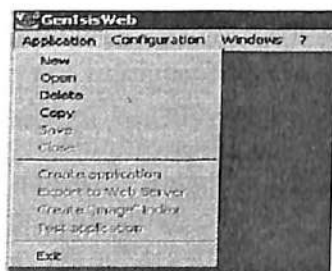


Fig-6: GENESIS application to WINISIS database

After selecting the database we need to click "OPEN" button, and we could be able to get the following message where we have to give a name for our application. Here we can give any name such as "Quest.01" and click OK button and this simple process is shown in Fig-7.

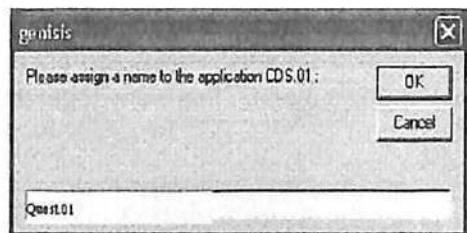


Fig-7: To define name for the particular application

On completion of the above processes we will get the following window with three forms: Query form, Format listing and Format details.

Query form : allow us to design the web like Query Form (a front end search form) with a search box for searching the database with any search term. It also helps us to find the indexing terms included in the inverted file of our database, for selecting the appropriate search term.

Format 'listing': allows us to design a short display format. A user can select the Detailed Display format from this Short Display Format

Format 'details': allows us to design Detailed Display Format.

Using these above three formats, we have designed our Query form, Short Display Format and Detailed Display Format which has been illustrated below in Fig-8.



Fig-8: Designing of our Query form, Short Display Format and Detailed Display Format

Once we finish designing the query form we can test it. Now we can click on "APPLICATION" on the menu bar and click on "SAVE" on the dropdown menu. Then we will get this message as noted in Fig-9.

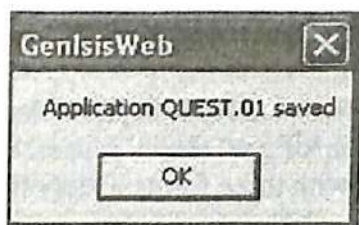


Fig-9: Method of Application Saving

The next step is to click on "OK", and again click on "APPLICATION" on the menu bar. And finally, click on "CREATE APPLICATION" on the dropdown menu. In this stage we will get this message as shown in Fig-10. We need to click on 'yes' and our web browser will open automatically and the query form will open in it.

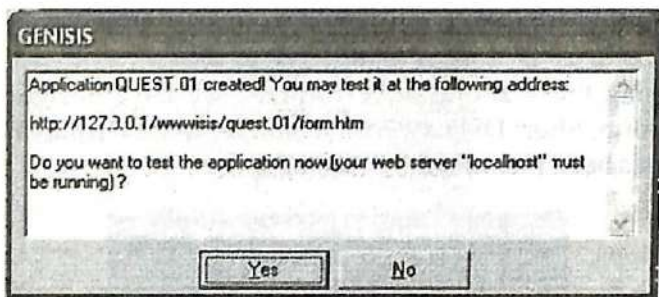


Fig-10: Creation of web browser and the query form

6.8 Query Form for Visva-Bharati Digital Library

Thus we have created the query form for the Visva-Bharati digital library, which is to be found in Fig-11. The following is the query form which should be field up by the user of Visva-Bharati Library Network for browsing the required document



Fig-11: The query form for the Visva-Bharati digital library

Result : After fill up the above form the users of the Visva-Bharati digital library will get the following result in short form. If any students or users like to observe details format of search he needs to click on 'Full Version' button like the Fig-12.

16 Result(s) for : (Year=2006) and (Course=ug) and (Subject=Physics)		
[1]	mfn	120
	Year	2006
	Course	UG
	Subject	Physics
	Part/Semester	1
	Paper	1
	Full Version	Question paper 2006 Physics UG Part 1 Physics (Part 1) 2006-1.pdf
[2]	mfn	121
	Year	2006
	Course	UG
	Subject	Physics
	Part/Semester	1
	Paper	2
	Full Version	Question paper 2006 Physics UG Part 1 Physics (Part 1) 2006-1.pdf
[3]	mfn	122

Fig-12: Way to get Full Version of the Visva-Bharati digital library document

Page : If the user the Visva-Bharati digital library clicks on 'full version hypertext link' he will get the following display format which is the actual requirement of the reader in page form of the digitized document clearly shown in Fig-13.

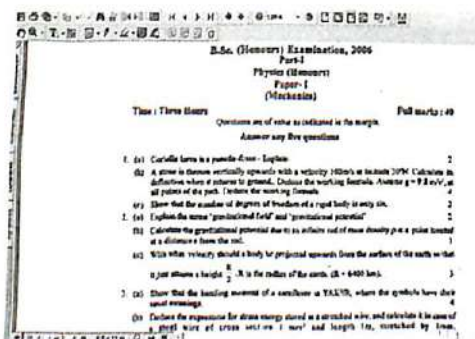


Fig-13: The page display form of the Visva-Bharati Library digitized document

Regarding the publication, figure-14 & 15 are given below. These newly constructed user friendly pages are introduced recently by us.

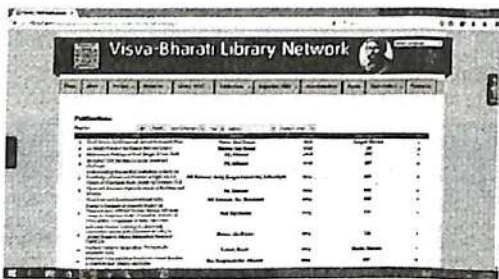


Fig-14: Staff publication page

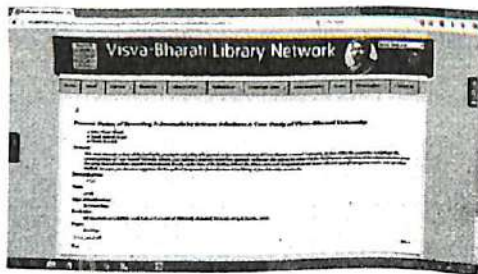


Fig-15: Staff publication page

6.9 The Model of Institutional Repository of the Visva-Bharati Library

The total process of creation of the Visva-Bharati digital library database and surfing of digitize page document by the user are to be found stage by stage in the following way:

The blueprint of creation of digital library at Visva-Bharati Library through the combined use of two open source software WINISIS and GENISIS. Our database has two integral parts. One is internal, reserved for the use of creation and maintenance of organizational database by the employees who are assigned for creating and developing the database. The other is external, which is normally used for searching or browsing the database and surely be user friendly.

We may analyze the model stepwise. Firstly, it is necessary to select the document for scanning, which transfers the physical document into image. Secondly, it needs to save and upload the images into server; and it takes the processes: transfer of image file to PDF file, then the PDF file is uploaded to the server. Third step is creation of metadata of PDF files through 7.

7. WINISIS.

Fourth step is search metadata and actually the FST file of WINISIS helps users to search the document through metadata. The fifth step is search fields which are generated in WINISIS database. Sixth step is link through the GENISIS interface and search fields are linked with the WINISIS metadata. In seventh step, the users can choose the required search fields for proper search result; and in this step the user will get the result through the GENISIS display format which is created at the time of GENISIS installation. Lastly, if the user clicks on the full version field on the GENISIS interface, then he will get the original required PDF file and he can copy or print the document which ensures his full satisfaction. Here the entire search filed and search results are totally maintained externally through GENISIS.

It should be noted that user cannot enter to the internal part

(WINISIS), they should follow the steps of dotted arrows only, and that is why the metadata and the documents are totally secured for the university library. On the other hand, library staff engaged for the creation and maintenance of digital library database can move through any way.

8. Conclusions

The IR of Visva-Bharati aims to transform scholarly communication by making it easier for researchers to find and consult the results of research of the University, through unrestricted online availability. It includes University research literature consists of on-line copies of peer reviewed journal articles, conference papers, theses, technical reports and working papers. In most cases IR can be used freely for research, teaching and other purposes. It is true that not all the faculty members of Visva-Bharati Network have contributed their published papers and other thinks in this IR, but the numbers of faculties are increasing. The experiment with the Question papers and Syllabuses in Visva-Bharati IR is functioning as unique one and the students use it vigorously. Here in Visva-Bharati University question papers and syllabuses are not available for sale for long past. The library is the only place where those are available and students can use those smoothly as per their requirements. During the pre-examination session students need to copy the question papers in the library reading room or can Xerox them. If the same like to copy, others' requirements cannot be fulfilled. Again, for the rigours use of the question papers caused the deterioration. Observing the situation library authority has taken decision to digitize all question Papers and syllabuses of the University and finally the IR has created with those digitized copies. It really very popular and useful service offered to the students community of the Visva-Bharati by the library.

Reference:

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5. "The Apache HTTP Server Project, 2002" Available at <http://httpd.apache.org/> accessed May 15, 2017).

Key Factors in Designing Institutional Repository : An Experience at Assam University

Mukut Sarmah
Sumana Chakrabarty Sarmah

Abstract :

Creation of new knowledge through the practices of research and scholarship is a core activity of the higher educational institutions. Research and scholarship created within a university community should be disseminated in a large scale to the global world for building capacity of the institutional research and to make contribution in the global research outputs. Dissemination of scholarly research output is a core responsibility of a university. Institutional Repository (IR) improves visibility of a university globally by capturing, organizing, preserving and disseminating the institutional knowledge assets to the scholarly world. The paper presents the experience of designing an IR at Assam University as it has been producing scholarly outputs through different research studies or projects since its inception. It discusses the key factors to develop IR for managing the intellectual assets produced by its academic community.

1. Introduction

Acquiring the quality and excellence has become the great challenge for all higher educational institutions. The importance of access to the institutions' research information or literary outputs

is indisputable, leading as it does to scientific progress and socio-economic strength. The latest developments in ICTs, and in particular the WWW, holds great promise for more equitable distribution or dissemination of intellectual assets or information and the ideal of a global knowledge commons is no longer seen as an unattainable goal. In the present digital era, higher educational institutions have to manage their intellectual, educational, research and associated assets more effectively and transparently than in the past. The great advantage of managing these assets helps institutions to develop coherent and coordinated approaches to the capture, identification, storage and efficient retrieval whenever need arises. Due to advancements of ICTs, it has become possible to manage the intellectual assets of any form digitally with ease by establishing a common store to be accessed by all. As universities are considered to be the one of the main creators of intellectual assets, so helping them to manage and capture intellectual assets as a part of their information strategy has become very essential.

Assam University, Silchar has been producing scholarly outputs through different research studies or projects since its inception. Assam University should have its own system of managing all the scholarly literature produced by them with the motto to enable the intellectual community of free sharing of information, encouraging collaboration, quick access, widespread communication and research activity. But, until the time when the project proposal was initiated, Assam University did not develop any Institutional Repository for managing its intellectual assets. There lies the challenge for the university to have its own Institutional Repository. The plan proposal was prepared aiming at which was one of the proven mechanisms adopted by many academic institutions in India and abroad which would benefit the academic community of Assam University.

2. Institutional Repository: The Concept

Over the past few years libraries has witnessed tremendous development in the field of information and communication

technology, which has resulted in the changed trends in publication of the information as well as in the storage of information. Many of the information sources such as journals books, monographs etc. which used to be published in a printed form has been shifted to electronic version. Users as well as authors are also preferring this new medium of publication, which has resulted in an exponential growth of scholarly literature on the web on one hand and on the other hand it has put several difficulties on the accessibility of the literature.

Institutional Repository is a new concept for collecting, managing, disseminating, and preserving scholarly works created in digital form by the scholar's community in an individual institution. An Institutional Repository is an online locus for collecting, preserving, and disseminating in digital form the intellectual output of an institution, particularly academic or research institution. In a university, this would include materials such as research articles, before undergoing peer review or pre-prints; and digital versions of theses and dissertations. IR also includes other digital assets generated by normal academic life, such as the administrative documents, course notes, or learning objects.

Institutional Repository is an online archive of an institution's scholarly papers, deposited by their authors. Institutional Repositories may include a variety of research output of an organization such as datasets, administrative documents, course notes, learning objects, or conference proceedings. Deposit of material in an Institutional Repository is sometimes mandated by that institution. An Institutional Repository is a means to ensure that the published work of scholars is available to the academic community even after increases in subscription fees or budget cuts within libraries. The majority of research scholars do not provide free access to their research output to their colleagues in an organization. IRs provides scholars with a common platform so that everyone in the institution can contribute scholarly material to promote cross-campus interdisciplinary research.

An Institutional Repository can be viewed as "a set of

services that a university offers to members of its community for the management and dissemination of digital materials created by the institution and its community members." For a university, this includes materials such as monographs, e-prints of academic journal articles-both before (pre-prints) and after (post-prints) undergoing peer review-as well as electronic theses and dissertations (ETDs).

From the above discussions, it is clear that an Institutional Repository is an online archive for collecting, preserving, and disseminating digital copies of the intellectual output of an institution, particularly a research institution.

Institutional Repositories also have roles beyond disseminating and managing the works of individual scholars that are part of the dialog of scholarly communication and it is also a place where we can put much of the material that research libraries identify as worth collecting and they offer a framework for organized stewardship and accessibility of these materials. It can encourage the exploration and adoption of new forms of scholarly communication that exploit the digital medium in fundamental way. Institutional Repositories benefit both the institution and its scholars by raising the institutional profile while also bringing broader dissemination, increased use and enhanced professional visibility of scholarly research outputs

OpenDOAR reveals that Europe has been the leading continent to have highest percentage (45.9%) of IRs followed by North America and Asia with 22.7% and 17.2% respectively. Country-wise Institutional Repository reveals that United States is having highest number of IRs i.e., 292 with a percentage of 22.96 of world IRs whereas India is in 11th position with only 29 IRs (2.84%) of world's IRs. Universities like University of California, University of Illinois, University of Glasgow, University of Sydney, etc. are some of the universities abroad which are having their own IRs. The numbers of IRs are increasing rapidly looking at the importance of these in the academic communities.



Figure 1: Proportion of Repositories by Continents

Directory of Open Archive Repository presents 53 repositories in India out of which 88.7% repositories are institutional which includes universities, research organisation, laboratories or others. UGC's INFLIBNET Centre, Ahmedabad has been the best example having institutional repository that keeps all the proceedings / seminar papers of national and international conference organised by the centre for the benefit of the scholars.

In, NE India, there was only one university having Institutional Repository till date when the project was started. North Eastern Hill University (NEHU), Shillong established its IR and it provides a single platform to access all the research / literary outputs of the faculty members and academic community.

No higher educational institution in Assam including Assam University was having Institutional Repository to manage their intellectual assets. That is why the study has become an urgent need of the hour for Assam University and has got high significance.

3. Objectives of Project Study

The main objective of study is to ascertain and organize scholarly/intellectual outputs and to develop an Institutional Repository for Assam University.

The study has the following other objectives:

- ♦ To gather information on individual's scholarly outputs

- To ascertain the departmental literary activities
- To understand the impact factor and the quality of research publications
- To obtain increased worldwide visibility of the scholars of Assam University with a public domain through the Internet
- To provide long-term solution for Assam University of Scholarly / Intellectual Assets

4. Review of Literature

Review of literature on the present study was aimed at understanding the creation and development of Institutional Repository, so an attempt was made to present review of all the available and relevant literature. Sutradhar (2006) showed in his paper the example of how to set up an IR and how to create different communities and, under each community, many collections using the DSpace software. Krishnamurthy and Kemparaju (2011) made an attempt in their paper to report on a study of the Institutional Repositories in use in Indian universities and research institutes. Repositories in various institutions in India were accessed and described in a standardized way. Sharma, Saha, and Meichieo (2008) published a paper on "Institutional Repositories and Skills Requirements a New Horizon to Preserve the Intellectual Output: An Indian Perspective" and discussed the Institutional Repositories (IR) as a very powerful idea that can serve as an engine of change for any Institution. Babu et al. (2012) mentioned that the IR categories and their nomenclature are found to be overlapping when used by repository registries and librarians alike. Sawant (2012) in her study, observed that 85.94 percent of respondents (154) were aware of the IR facility/service and 14.05 percent (26) were not aware of IR. Jain (2011) conducted a study with a purpose to assess the benefits and possible obstacles of setting up an IR. He reviewed the recent literature about Institutional Repositories (IRs) including. It also discussed librarians' and authors' participative roles and open access. Jain and

Shrivastava (2008) studied the recent development in information and communication and web technologies that has changed the landscape of information handling activities. These technologies provide a simple, web based mechanism for researchers to deposit ('self-archive') and access their research publications via digital repositories. The paper discussed the genesis, objective, methodology, contents, advantages, software usages, growth and development of Institutional Repositories in India. Laxminarsaiah and Rajgoli (2007) describe how the ISRO HQ Institutional Repository idea emerged and what are the steps taken to implement and build the IR. The scope of the repository, which started with newspaper clippings, has been enhanced to accommodate research papers, speeches/lectures, office orders/memorandums, videos, annual reports and the in house publications. Sarmah (2011) published a paper on "An Evaluative Study on the Institutional Repositories in Indian Context" in Conference Proceedings of International Conference on "University Librarianship: An Academic Challenge and Opportunity" held from 14 - 15th July 2010 in Colombo, Sri Lanka organized by University Librarians' Association of Sri Lanka and made an attempt to discuss the present scenario of IRs in India. He discussed the importance of IR in Indian context.

Lynch (2003) expresses in his article entitled "Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age" in the ARL Bimonthly Report, (p. 226. www.arl.org/newsltr/226/ir.html) that IR is the main way to communicate to the outer world through their scholarly outputs. Hirwade and Hirwade (2006) enumerated variety of materials in Institutional Repository that produced by the researchers of the institution such as pre-prints, post-prints, teaching material etc. Johnson (2002) discusses various issues of Institutional Repository in his article entitled "Institutional Repositories: Partnering with faculty to enhance scholarly communication" in D.Lib. Magazine. He explains how an IR could be the access points to faculty members to the scholarly literature.

Bailey (2005) focuses on the diversity of digital materials that IRs can contain: An Institutional Repository includes a variety of materials produced by scholars from many units, such as e-prints, technical reports, theses and dissertations, data sets, and teaching materials. Some Institutional Repositories are also being used as electronic presses, publishing e-books and e-journals. Campbell and Meier (2011) in their study investigated the development of Institutional Repositories at doctoral institutions, identifying factors that influence development and best practices using a comparative case study. Liu and Zhou (2011) in their paper, they have described the Colorado State University Libraries' experience to date in developing an IR using DigiTool. Cervone (2008) stated that many libraries have developed local digital repositories. The main objective was to focus on the emerging concepts of digital repositories. The author found that many libraries were focusing mainly on digitizing their collections. Krevit and Crays (2007) have opined that the success of the Institutional Repository depends on appropriate communication with faculty, a deep understanding of the publishing process, identifying appropriate partners, designing a flexible technology infrastructure, and engaging in active collaboration with key players. Dobratz and Scholze (2006) stated that repository certification will not be the main factor in achieving open access to academic information globally, but it can support the spread of Institutional Repositories and enhance visibility of the "Institutional Repository"-service. In their paper they described a unique approach that has been implemented in Germany and could be transferred to other countries and communities. Gibbons (2004) presented compelling reasons for why an organisation would want to establish an IR including providing an infrastructure for preservation of digital content, lowering the barrier to document distribution, creating a centralised digital showcase in which research, teaching, and scholarship can be highlighted, and facilitating wider distribution.

5. Methodology

The Study required the application of Experimental Method with different software and hardware tools to develop the ultimate Institutional Repository in the Department of Library and Information Science, Assam University. It required the understanding of the factors that can have impact on designing the IR such as, history, location, type of university, branches, schools, departments, teachers, facilities fund, time limit, and others, available for the implementation of the project.

In Assam University, there are 16 Schools, 35 Post Graduate Departments. Survey of all these schools and departments needed to be made. All schools and departments have been taken under the purview of study for collecting data. The departments consist of more than 300 faculty members, around 1500 research scholars. Datasheet pertaining to the individual's scholarly outputs were distributed to all the members of the academic community to fill up and return. Project Fellow was appointed and procurement of the hardware and software were made phase wise. DSpace software was installed in Linux OS (CentOS) platform along with all pre-requisite software. DSpace was customized according to the desired objectives to be achieved. The mechanism for storing the intellectual output of the University was tried to develop. It required in-depth study in terms of policy issues, management techniques, workflow pattern, submission procedure, long-term preservation, multi-script records management, global access and retrieval mechanism.

6. Core Issues

Following have been considered as the core issues expected to be addressed by Assam University for creating IR with an immediate effect:

- ♦ Policy Issues
- ♦ Organizational Issues
- ♦ Cultural Issues

A policy for IR at Assam University was prepared where duties and responsibilities of each of the persons concerned were

identified. Work flow of the IR has been clearly designed for successful implementation of the project.

7. Functional Components of IR at Assam University

Under the policy decisions it needs to identify the Scope (e.g., multidiscipline / single subject / entire research output / database for each functional unit), Types of documents (e.g., single database for different types /single one), Software (e.g., Open Source Software like DSpace), Research deposit types (e.g., thesis, journal articles, preprints, reports, conference papers, book chapter, etc.), Resources (e.g., skilled human resources, servers, funding), Stake holders (e.g., library, each department, institute as a whole) and Training and Services.

The Figure 2 presents the functional components of Institutional Repository of Assam University after implementation. Here, all the components have to be interdependent and interrelated to achieve its final goal.

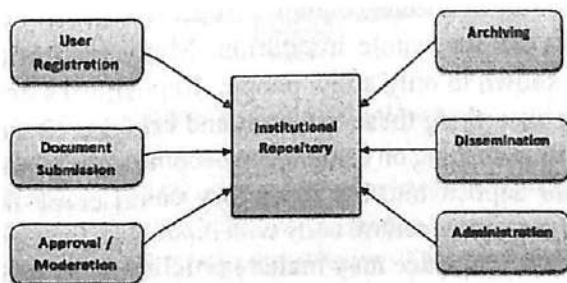


Figure 2 : Functional Components of Institutional Repository

8. Key Issues for Developing Institutional Repositories

Here are some of the key issues to consider when developing repositories:

- ◆ The institutional culture
- ◆ The scope of the repository
- ◆ Content
- ◆ Access levels

- Legal aspects
- Standards
- Sustainability
- Funding

Institutional culture depends on how the organization is structured as well as how much collaboration and trust exists within an institution. In academic organizations, faculty belongs to departments, disciplines, and research groups. Academic competition may be fiercer in some universities than in corporations. In an internally competitive environment where cooperation and trust are not nurtured, building a repository will become more difficult. Faculty will not contribute willingly to a central repository unless they have been consulted and trust the process. Faculty need to be convinced that contributing to a repository will enhance their reputations in their disciplines and result in wider dissemination of their work.

A repository may be limited to self-archiving by authors or may include the intellectual output and business and administrative documents for the whole institution. Many institutions have treasures known to only a few people. Repositories provide the means for unearthing these treasures and bringing them to light.

Decision-making on content can become a contentious issue. Criteria for deposit into the repository could come from each community or from a central body with input from the participants. The contents at DSpace may include articles, reprints, technical reports, working papers, conference papers, e-theses, data sets, image files, audio and video files, and reformatted digital library collections. Policies for the deposit of content and who may contribute content come from each community, but the DSpace guidelines specify that material must be "education-oriented," in digital format, and produced by an institution member.

9. Key Factors for Success in Building IR

Key factors for success in building a repository involves eight "C" words:

Comprehension:

It means that all members of the team must share a common vision and understanding of the purposes and scope of the repository.

Collaboration:

It involves thinking and working together, with different people contributing their different talents, working with others to solve problems, and making important decisions.

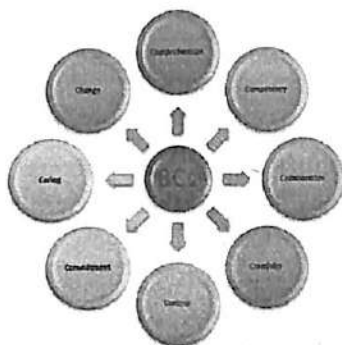


Figure 3: Eight "C" Words

Context:

Context is each person's worldview and working environment. Each person has a unique mind-set based on background, education, and experience. Thinking and working together in a non-threatening atmosphere helps people integrate other contexts into their own.

Change:

Repositories involve change in the way research is disseminated, preserved, and published. This change requires faculty to deposit their research results, data sets, and other materials in the repository - a new step in the research process. In corporations, management may require staff to deposit items, such as strategic plans, marketing plans, and working papers.

Caring:

It motivates the desire to share research results and joint

scholarly endeavors, preserve history, and provide knowledge and information needed for future generations to learn. Caring leads to the commitment to deposit one's scholarly work in the repository, encouraging others to do likewise by contributing ideas and energy.

Commitment:

Managers show their commitment by understanding that repositories will grow and require support and funding in perpetuity.

Creativity:

It involves imagination and the ability to visualize a new way of doing things. New ideas can come from anywhere - from individuals or groups of individuals.

Competency:

It means knowing how to make the repository work for all its constituents. Librarians and archivists need to carry their collection development skills and operational know how to the repository project. Information technology staff demonstrates their competencies by knowing about the software, hardware, networking, and standards needed to make the repository serve everyone.

Inadequate funding has been the major problem faced in creating open access Institutional Repository for Assam University, Silchar. The states of ICT infrastructure in the academic institutions of North East India are low and require complete renovation in order to sustain the development of IRs. The development of IRs in universities of Assam is also in infant stage in comparison to other states of India. UGC should have provided sufficient financial assistance to make the IR sustainable forever.

Lack of awareness about open access Institutional Repository among the scholars and teachers community appeared to be another important issue to the development of open access Institutional Repository at Assam University. Lack of awareness leads unwillingness among the users in depositing pre-print or post-print of their published research works in the Institutional Repository.

Institutional Repository requires high Information

communication Technology (ICT) infrastructure and connectivity. Without necessary ICT infrastructure it is not possible to create IR but here in this project the funds allocated by UGC for purchasing equipment was not sufficient that's why minimum infrastructure has been developed.

10. Conclusion

Designing the Institutional Repository for Assam University had been a great challenge and University Grants Commission had been very kind to approve the project proposal. Successful implementation of an Institutional Repository mainly depends on three factors such as i) Selection of Software, ii) Selection of Hardware and iii) Selection of Manpower. The Principal Investigator faced the challenge of inadequate funding in creating open access Institutional Repository for Assam University, Silchar. Institutional Repository requires high ICT infrastructure and connectivity. An Institutional Repository can fail over time for many reasons: fund, policy, management failure or incompetence or technical problems and so on. Maintenance and sustainability are key issues that involve the long-term commitment of money by the authority. A repository cannot run by itself. It needs constant attention. Maintenance of content, software, and accessibility can change. The IR designer needs to know the consequences of changes in hardware, software, and standards and be able to adjust accordingly. Everyone involved in the repository needs to understand that the project has become a part of their everyday life and will require attention and funding in perpetuity. Funding agency including the Assam University authority has to raise and allot fund on yearly basis to ensure that the repository gets its correct shape with sufficient ICT infrastructure and remains forever for the benefits of academic community.

Acknowledgement:

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Web Links to Some Institutional Repositories in India with the Names of DL Software Used

Sl No.	Name of the University	Link to IR	Software used	Size
1	Cochin University of Science and Technology- Digital Library	http://DSpace.cusat.ac.in/jspui/	DSpace	6833
2	Cochin University of Science and Technology- Digital Repository, Dyuthi	http://dyuthi.cusat.ac.in/xmlui/	DSpace	3647
3	Goa University	http://library.unigoa.ac.in:8081/xmlui/	DSpace	534
4	Guru Gobind Singh Indraprastha University	http://DSpace.ipu.edu:8080/xmlui/	DSpace	135
5	IGNOU (egyankosh)	http://www.egyankosh.ac.in/	DSpace	26996
6	Jadavpur University	http://DSpace.jdvu.ac.in	DSpace	28129
7	KLE University	http://182.48.228.18:8080/jspui/	DSpace	430
8	M.S University of Baroda	http://14.139.121.106:8080/jspui/	DSpace	261
9	National University of Educational Planning and Administration, New Delhi	http://14.139.60.153/	DSpace	5732
10	North-Eastern Hill University	http://DSpace.nehu.ac.in	DSpace	4590
11	Osmania University Digital Library	http://oudl.osmania.ac.in/	DSpace	24506
12	PanditDeendayal Petroleum University, Gandhinagar	http://203.77.192.116:8080/xmlui/	DSpace	162
13	Pondicherry University	http://DSpace.pondiuni.edu.in/jspui/	DSpace	572
14	SRM University	http://digitallibrary.srmuniv.ac.in/DSpace/	DSpace	364
15	Thapar University	http://DSpace.thapar.edu:8080/DSpace/	DSpace	2636
16	University of Delhi	http://eprints.du.ac.in/	EPrints	170
17	University of Kashmir	http://DSpaces.uok.edu.in/jspui/	DSpace	989
18	University of Mysore	http://eprints.uni-mysore.ac.in/	EPrint	9286
19	Vidyasagar University	http://14.139.211.206:8080/jspui/	DSpace	633
20	Manipal University	http://eprints.manipal.edu/	EPrints	9245
21	Mahatma Gandhi University	http://www.mgtheses.org/	Nitya	1898
22	RGUHS, Delhi	http://14.139.159.4:8080/jspui/	DSpace	8537
23	Chitkara University	http://DSpace.chitkara.edu.in/jspui/	DSpace	161
24	Saurashtra University	http://etheses.saurashtramiversity.edu/	EPrints	1015
25	Central University of Jharkhand	http://DSpace.cuj.ac.in/jspui/	DSpace	341
26	Christ University, Bangalore	http://repository.christuniversity.in/	EPrints	4922
27	Aligarh Muslim University	http://socscylibraryamu.ac.in/	Calibre	14782

Building up an Institutional Repository using Greenstone Digital Library Software (GSDL)

Payel Mondal
Prakash Rabi Das

Abstract: In this age of Information explosion the library and information centers is profound its impact also. With the advent of information and communication technology the numbers of e-resources are growing and it has become imperative for information professional to redefine their role in disseminating information to the users. Institutional Repository is a new concept for collecting, managing, disseminating and preserving scholarly works created in digital form by faculty and students in individual universities and colleges. Greenstone is open source software for building digital repositories. Users can search the documents full text, choosing between indexes built from different parts. The whole insight of library has now changed from collection of books to a single window knowledge bank. This paper explains how to build an institutional repository using Greenstone Digital Library Software. It also discusses definition and features of open source library management software and their advantages also. Open source library management software is a solution to reducing that cost. The paper describes in brief about the feature of the open source library management software like Greenstone Digital Library which are useful for developing digital library and institutional repositories.

Keywords: Open Source Software; Greenstone Digital Library; Institutional Repository.

1. Introduction

A digital library is an organized collection of digital documents, in any format such as text, image, audio or video that would permit easy access by information users and proper maintenance by librarians. Digital libraries do replace the concept of a library as a repository of knowledge with the notion of it as a provider of information services to users. The Greenstone Digital Library Software (GSDL) offers exciting ways to build and distribute digital document collections. It helps us to publish digital collections on the Internet or on CD-ROM. Within a few minutes time, one can build full-text search indexes and browsing classifiers for any collection of digital documents. Once initiated, the collection building process will take place mechanically, running into several hours or days for a very large collection. Downloading digital documents from World Wide Web, organizing them into focused collections and making the materials accessible to others can be a prime application area of digital libraries.

2. What is the Greenstone Software?

- ◆ Software suite for building, maintaining, and distributing digital library collections
- ◆ Comprehensive, open-source
- ◆ Developed by New Zealand Digital Library Project at the University of Waikato
- ◆ Distribution and promotion partners:
 - UNESCO
 - Human Info NGO, Belgium
 - NCSI, Bangalore; UCT, Cape Town; Dakar, Senegal; Almaty, Kazakhstan; ...

3. Objective of this Study

The objective of this write up is to narrate, with screenshots, the most essential basic steps in building up a digital library of collection containing a few documents in an easy-to-learn style, in windows operating system.

4. Features of Greenstone

- ◆ Open Source Philosophy
- ◆ Interfacing & Content Delivery via Web
- ◆ Multi S/W Platform
- ◆ Multi Lingual Support
- ◆ Multi Formats
- ◆ Structured Metadata in XML using DC
- ◆ Metadata Extraction
- ◆ Searching & Browsing
- ◆ Plug-ins for Documents
- ◆ Full-text mirroring
- ◆ Text Level Penetration
- ◆ Data Compression
- ◆ Publishing on CDROMs
- ◆ International Presence
- ◆ Content Development (3 alternate ways)
- ◆ Predominantly GLI now - since (V. 2.41)
- ◆ Hierarchy Structure
- ◆ Interface Customization
- ◆ Front Page Design, Header for the Digital Library, Collection Icon, Cover Images
- ◆ Lifeline : Listserv / E-Group / Archives

5. The Power of Open Source

Greenstone uses

Ghostscript Interpreter for Adobe Postscript documents

(Postscript plug-in)

Kea	Keyphrase extraction program (to generate metadata)
Pdftohtml	Converter for PDF documents (PDF plug-in)
Rtftohtml	Converter for RTF documents (RTF plug-in)
TextCat	Detects languages and document encodings
wvWare	Converter for Word documents (Word plug-in)
Xlhtml	Converter for Excel/PowerPoint documents (plug-in)
XML::Parser	Parses XML documents, used to read and write Greenstone's internal XML document format

6. Building up a Collection with GLI

The simplest way to build a new digital library collection is to use Greenstone's Librarian Interface1 (GLI), a component of Greenstone Digital Library software. GLI allows one to collect the documents, import or assign metadata, and build the documents into a digital library, and convert it into a CD-ROM library.

GLI can be used to perform the following basic activities, while building up a collection: -

- * **Gather** documents for building up the collection
- * **Enrich** the documents by adding metadata
- * **Design** the collection, its appearance and the access facilities
- * **Format** the appearance of the digital library
- * **Create** the collection
- * **Convert** the digital library into a CD-ROM library

7. Collection Building

- ♦ Input: a set of source documents, possibly in many different formats
- ♦ Greenstone "imports" these documents and converts

them to its own internal (GA) format

- Extracts as much metadata as possible

- ♦ Greenstone "builds" indexes and browsing structures using the GA files
- ♦ Start with a few documents, get the design right, then add the bulk of the documents
- ♦ Web Interface mode has been withdrawn temporarily.
- ♦ The GLI based collection building is quite easy and simple a method.
- ♦ Collection developers can activate the GLI software and use the 'Gather', 'Enrich', 'Design', and 'Create' panel for making collection

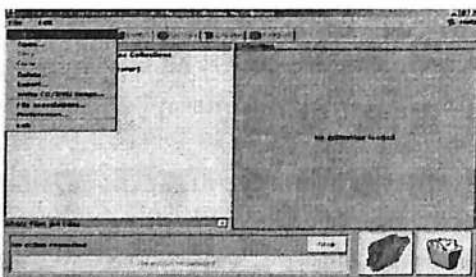
8. Start a New Collection

8.1 Open the GLI from the

Start → Programs → Greenstone Digital Library Software v2.72 → **Greenstone Librarian Interface.**

To start a new collection, choose **New** from the **File** menu.

Figure 1: Starting a new collection



Fill up a name for the collection (against *Collection title*) and a brief description about the collection (against *Description of content*) in the appropriate column in the pop-up window. Choose new collection in the **Base this collection** on dialogue box and click **OK**.

8.2 Gather the Documents

Now the **Gather** panel will become active and it allows the user to collect the required documents by exploring the entire computer. Then select the files or directories by browsing the folders in the computer. Drag and drop the right hand pane by your mouse. You can drag the documents either individually or as sets of documents in folders/subfolders. When you gather the documents, the software usually prompts you to select the **Plug-In**, if the suitable **Plug-in** is not included. In such cases, please click the **Add plug-in** button.

8.3 Enriching Documents with Metadata

The next stage is to enrich the documents by adding metadata³. One can select the individual document and add metadata such as title, creators or subjects manually. Click on **Enrich** tab and it will bring up a panel. Left side of the panel under *Collection* tab shows the files. The right side, on clicking, will allow adding metadata for each document on each metadata field in the *Value* box against the *Element*. Here we use Dublin Core metadata and that is why *dc.* is prefixed with name of metadata elements such as Title, Publisher etc. Type the Title of the document against **dc.Title**, type the Creator (Author) of the documents against **dc.Creator**, and type the Subjects (Keywords) against **dc.Subject** and **Keywords** for each selected document shown below *Collection* tab as in the above figure.

8.4 Design the Collection

Then design the collection by choosing the needed features given under the **Design** menu. Collection design consists of many facets as given in the left side pane. **Document Plug-ins** Click on **Document Plug-ins** to add the required **Plug-ins** needed to convert the document into the document format (greenstone archive format) required for greenstone. All **plug-ins**, needed for

handling common documents, will be loaded by default at the time of installation. Kindly note that if proper Plug-in is not loaded, the software cannot build the digital library collection.

8.5 Create Search Indexes

Choose the **Search Indexes**, shown next below on the left pane, for creating *Search Indexes*. Search Indexes determine whether to confine the search to paragraph, chapter or the entire text of the document. Remove the default indexes for *ex.Title* and *ex.Source* by selecting the index description under *Assigned Indexes* and then by clicking on the **Remove index** button. Do not remove the search index for **text [Default Index]**.

8.6 Adding New Indexes

Click on the **New Index** button, select the **dc.Title**, **dc.Creator** and **dc.Subject and Keywords**, by tick marking on the check box one by one, and add them one by one by clicking on the **Add Index** button. That means we should select *dc.Title* first and add it, then select *dc.Creator* and add it and so on.

At the end, all the three indexes will be added one by one and may select an index and move it up or move it down by clicking on the buttons on the right side so as to set the order of its appearance. Likewise one can set any index as default index by using the **Set Default Index** button.

8.7 Browsing Classifiers

If someone wants to browse on a metadata element, they must set up a **Browsing Classifier**, independently of creating an index on this metadata element. **Browsing Classifiers** such as **Titles**, **Creators**, **Subjects** help you to browse the collection. Select **Browsing Classifier** by clicking on it and then click on the **Remove Classifier** button for removing them one by one. Remove the default **Browsing Classifiers** for **Title** and **Source**

shown below. Now, choose **Select classifier** to add pull down list and select **A-Z List** or **A-Z Compact List**. Then click on **Add Classifier** and add the Browsing Classifiers7 for **Title**, **Creators** and **Subjects** by one by one. When one click **Add Classifier** button in the above screen, one will get the window for choosing the **Browsing Classifier**. Select the browsing classifier for **Title** by choosing the metadata (*dc.Title*) as follows:-

Figure 2: Adding Classifier CL1 for Title - dc.Title

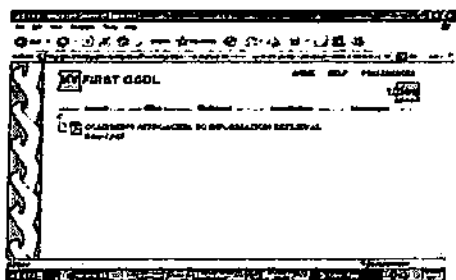


Now click **OK** button to add Title classifier. Then select the browsing classifier for **Creator** by choosing the metadata option (*dc.Creator*). Click **OK** button to add Creator classifier. Then select the browsing classifier for **Subjects** by choosing the metadata option (*dc.Subject* and *Keywords*) and then Click **OK** button to add Subject and Keywords classifier. Then **CREATE** option was chosen from the menu bar and **BUILD COLLECTION** was selected.

8.9 Build the Collection and Preview the Collection

Then go to the **Create** panel. Click on the **Build Collection** button and the progress bar will show the progress in building 10 the collection. At the end of the building process, Click on the **Preview Collection** button to view the collection built. The preview of the built collection was shown with the collection title as given at the very first stage of this whole work.

Figure 3: Preview Collection



9. GLI Functions

- ◆ Establish new collection (or work on old)
- ◆ Select files to include in collection (Gather)
- ◆ Enrich files with metadata (Enrich)
- ◆ Select Plug-ins, Indexes, Classifiers (Design)
- ◆ Build Collection (Create)
- ◆ Customize Appearance
- ◆ Preview Collection

10. Conclusion

The basic greenstone collection with normal *look and feel* can be created within a few minutes time. The digital library collection created thus can be customized later in a variety of ways. You can radically alter the style of the pages generated, by changing the *macro files* included in the 'macro' folder of the Greenstone installation. A general-purpose digital library like greenstone is a useful tool to provide information services in our libraries. Absence of knowledge on how to use it should not come in the way of exploiting the advantages it offers. This documentation may be used as a tool to bring in more people to the growing constituency of greenstone users. We, the librarians, can improve our capabilities, as knowledge managers, if we are particular in learning the information technology tools like greenstone and use them for managing knowledge resources. We should learn, utilize, promote and propagate greenstone to make

our libraries better. ♦

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Digitization of Libraries

Anjuma Saikia

Abstract: We have a natural tendency to preserve our things. And for this we use different techniques. Traditional library is a type of preservation technique for printed material. But the printed documents have a tendency to decay. Emerging technology provide us new technique for preservation of printed documents. Digital library is a type of preservation technique which gets highest popularity now a day. In this paper, an effort has been made to give an idea about the process of digitisation, requirements for digitisation, problems and prospects of digitisation etc.

Keywords: Digital Library; Digitization; Digital Object;Scanner.

1.Introduction

New emerging technology has changed the concept of traditional library. Now days we are mostly depend upon computerisation and networking facilities. We need our information in one click. Nobody has enough time to spend in the libraries. The service of the libraries is also changed with changing time. New technology changed the concept of traditional library to automated library, then to digital library, then to virtual library etc. Now, we cannot say that library is a storehouse and librarian is a custodian of books. For us digital library is a new trend in library. It gets immense popularity among all of us. With the arrival of digital library the duty of the traditional librarian has also changed. We experienced these changes in organisation, collec-

tion and in the library services. The advantage of creating digital library is that by using computer and networking facility we can access our required information offline or online. So, latest technology helps in the development of digital library.

2. Concept of Digital Library

In a digital library all the collections and services are in digitised form and in organised manner. Digital library provide us digital document in any format, such as text, image, audio or video etc. From a digital library the users also access and retrieve their required information easily .With the development of digital library an experienced, technically sound librarian shows his/her competency in selection, organisation and maintenance of digital collections. There are many definitions about digital library. Some of them are as follows

William Saffady define, "Digital library is that maintain all, or substantial part, of its collection in computer process able form as an alternative, supplement, or complement to the conventional printed and microfilm materials that currently dominate library collections"(William Saffedy;1995;p.221)

3. What Consists of Digital Library

Following elements are required to develop digital library:

3.1 Digital Objects: Digital objects are the main element before considering digital library. Digital objects are two types: born digital objects and Digitized objects. Born digital objects are primarily come in digital form which includes e-book, e-journals, e-resources etc. Digitised objects are those which are converted from other form to digitised form.

3.2. Hardware: The next element is hardware. Hardware is that part which can be seen and touched physically. The following hardware is essential to make digital library:

a. PC (Personal Computer): Well numbers of PCs connected in LAN are essential for developing digital library.

b. Server: Server is a computer programme that provides services to other computer programs and their users in the

same or other computers. The computer that a server program runs in is frequently referred to as a server. Server is the main of digital library. Servers provide a platform to perform different tasks.

c. Input Devices: It includes scanners, digital cameras, video cameras, photo CD systems etc. These input devices are mainly used to capture images. Scanners are come in various types which include Flatbed scanner, Sheetfed scanner, Handheld scanner etc. In developing digital library flatbed scanners or digital cameras are use widely. Individuals' choice get must importance while selecting input devices.

d. Output Devices: Output devices are used for disseminating information either in the hardcopy or softcopy. It includes Monitor, Printer, Plotters, CD-Writers, Speakers etc. All these output devices can be used effectively in developing digital library.

3.3. Software: Software is a set of computer programs procedures, and associated documentations related to effective operation of a computer system. For developing digital library well defined and well develop software is must. It contains the following:

- Window 98/2000
- HTML editor: HTML editors are two types- Text based editors and What You See Is What You Get type (WYSIWYG) editors. Examples of text based editors are Microsoft Notepad, Microsoft Word. Microsoft FrontPage, Netscape Composer, is example of What You See Is What You Get (WYSIWYG) type editor.
- XML editor: It Help in mark up process and shows tags in a hierarchical and graphical display. Examples of XML editor are XMetal, XML Spy etc. The cost of mentioned XML editor is very high so we can use Note Tab Pro which comes in low cost.

- ◆ **Text editor:** Text editor are used for creating text files. Popularly used text editor software is Word, Microsoft's Notepad, Coral Word Perfect etc.
- ◆ **Optical Character Recognition Software (OCR):** OCR convert text image into data that can be processed by word processing software. The advantage of OCR software is that it saves time while editing the text files. Name of OCR software are Easy Readers, Omni Page Pro, Prime Recognition etc.
- ◆ **FTP Software:** File Transfer Protocol (FTP) is used to create connection from one computer to another host computer on internet in order to access files and can download, upload, or move them into remote computer. Firezilla, SmartFTP, WS-FTP are examples of FTP software.
- ◆ **Search engines:** Search engine search and retrieves information from the internet. Google, Alta Vista, Info seek are some example of search engines.
- ◆ **Image Editor:** Image editors are used for capturing, editing, scanning and manipulating image. By using image editor we can resize images, crop and develop image for website and also save them in multiple format. Image editor is helpful in online publishing and archiving. Adobe Photoshop, Paint Shop Pro are widely used image editor.
- ◆ **Page layout and design software:** Page layout and design software helps us in designing page. We require page design and layout software for developing in-house publications or to digitize publications that are in a page layout form. Example Adobe Page Maker.
- ◆ **File compression and encoding software:** File compression and encoding software are used for compressing files, folder, and programs. It is useful in reducing their original size and the space they use in volumes. After compression we can store the files, programs and folder in a minimum space.

3.4. LIVEWARE: Next important component of digital library development is live ware. It consists of experienced and technically sound manpower.

3.5. Finance: When we think about developing digital library we must give importance on financial assistance. For developing digital library we need huge amount of money. For this recurring and non recurring expenditure taken into considerations.

4. Issues to be Consider before Digital Library Creation

4. a. Interoperability:

Interoperability is a term which means the ability of two or more machines or components to exchange information and to use the information that has been exchanged.

4.b. Collection development and management:

Collection development and management is an integral part of any library. Today's age is called the age of information explosion. With the information explosion our library collection also increased day by day. But when we think about developing digital library we cannot digitize all the available resources of the library. Here we have to select those materials which have high demand among users. Sometimes it is seen that digitizing books, maps, atlas is very difficult than others. So in depth research should be done before considering for digital library.

4.c. Preservation:

Preservation is an age old tradition of library. Digital library is also a latest preservation technique. But here we are facing problems because everyday technology developed and new hardware and software emerged. So we need to regular refresh or migration of our software and hardware configuration to a current system to preserve digital information. When new technology emerged old information will be lost. Old information should be digitally archived so that it can be use when required. But the quality, authenticity, validation and metadata requirements are being into consideration before digital archiving.

4.d Cataloguing and Indexing:

Collection, preservation and dissemination are main function of a library. For dissemination of information proper cataloguing and indexing is must. Digital collection also requires proper cataloguing and indexing. Only then users get their information easily.

4.e Reference Service:

Digital information can be spread in a fraction of time if it is organized properly. In this regards reference service play a significant role. If proper reference sources are given to the user the maximum utilization of materials should be observed. Direct user access to information in digital format and essential service through computer network environment are two powerful emerging phenomena for which digital information can be used properly. (Krishnamurthy; 2004; p.321-324)

4.f Digital Right Management:

Digital Right Management is an umbrella term referring to technologies used by publishers or copyright owners to control access to or usage of digital data or hardware, and to restrictions associated with a specific instance of a digital work or device. The term is often confused with copy protection and technical protection measures, which refer to technologies that control or restrict the use and access of digital content on electronic devices with such technologies installed, acting as components of a Digital Right Management (DRM) design. Traditional rights management of physical materials benefited from the materials' physicality as this provided some barrier to unauthorized exploitation of content. (<http://www.dlib.org/dlib/june01/iannella/06iannella.html>)

5. Why Digital Library?

- Minimizes the duplication of new invention.
- Helps in resource sharing.
- Saves the library manpower and funds.
- Universal accessibility.
- Support to both formal and informal learning.

- Remote access is also possible.
- It reduces the massive storage problem.
- It can be used to preserve manuscript and other rare document.

6. Conclusion:

Though, digital library gets immense popularity among us. But in academic environment digital library creation is a dream for some of us. Besides having technical knowledge without support from the authority it is not possible to develop digital library. We can introduce digitization project by using above mentioned hardware and software. Librarian has to take final decision what software or hardware should be chosen to create digital library. Fast developing technology is also a problem before the librarian. Librarian must choose the appropriate software and hardware according to the need of the library. Again, at regular interval librarian should engage himself/herself in refreshing or migrating the software and hardware configuration so that after sometime digital information would not become obsolete to the users. User-friendliness of library and information system is an important consideration in development of digital library. So selection and creation of a digital library with user friendly software is a big challenge in the digital era. ♦

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Beyond Books :

The Concept of Academic Library as Learning Space

Mukesh Saikia

Introduction

Man's quest for knowledge since the dawn of civilization knows no bounds and limits and never satisfied. This quest for knowledge has created and accumulated tremendous amount of information. This knowledge is valuable for mankind and need to be preserved. With the invention of paper man has able to convey this knowledge to other by writing Books. Thousands of manuscripts have been written by wise men and many of them destroyed due to lack of proper means of preservation. With the invention of printing press, it became easier to preserve knowledge in the form of printed books. The need for preservation and dissemination of knowledge and information led to establishment of libraries. Thus libraries acquired a great importance in the civilized society for education and research. Libraries play a vital role in the development of any society and cater to the need of information needs of thousands of peoples.

The development of Science and Technology in the last two centuries has led to an information explosion. In order to meet the growing needs of users for information the libraries have been greatly improved and upgraded to meet new challenges. With the advent of new technology in the field of computer and

telecommunication, revolutionary changes have taken place in libraries. The shape of traditional libraries containing large number of printed documents is in the process of being transformed to paperless libraries containing a large number of digitised documents. The facilities offered by computer network have not left libraries untouched. Modern libraries are not only digitised but networked also. This has led to the creation of virtual libraries i.e. libraries without wall through which user has access to information at any time, anywhere in the world by using the modern tools of communication such as Internet facilities. The traditional image of library is changing.

Academic Library

Technological developments, policy changes and financial pressures within high education have influences universities to rethink the purpose and function of academic libraries. The main purpose of academic libraries from beginning to mid-1990 was curation of their collection- repository of information often serving as intellectual heart of the university. The core role of academic libraries was to develop and make available a collection of scholarly resources. This role was so significant that the reputation of an institution could be measured by the size, breadth and depth of its library's collection. The collection is important but it is not sum of a library. User definition of academic library has changed. There needs to be more radical reconceptualization of academic libraries to ensure that they maintain their central role within universities.

The current research suggests that there is no longer a fair representation of academic libraries or libraries elsewhere in the educational sector. Users' demands have changed. Academic libraries as spaces have changed dramatically over the past 30 years to stay relevant and avoid vacancy. Library spaces are physically transforming, the understanding and conceptualisation of libraries for many users is still library is information repository. Academic libraries are beginning to change through the engagement of stakeholder and users and there is still a need for

academic libraries to be redefined.

There needs to be more radical reconceptualization of academic libraries to ensure that they maintain their central role within universities and higher education as a whole. As spaces, academic libraries have changed dramatically over last 30 years. These changes need to be reflected in the concept of academic libraries.

Understanding Academic Libraries as Spaces

Universities may develop the physical library space; users will not change their conceptualisation of such spaces unless they are engaged in the process.

Spaces as a concept

As a concept, space can be considered in many ways. Within higher education, some authors discuss space in the physical sense and some authors in the mental and metaphorical sense. There is a relationship between the two and it is often difficult to draw a distinction between physical and metaphorical senses. Both understanding of the space need to be considered because the conceptualisation of libraries as learning spaces is a social product of library spaces and the metaphorical constructions of their users. Some authors discuss a triad of spaces- perceived space, conceived space and lived space. Perceived space is physical, mathematical and measurable whereas conceived space is made of the flows of people, money and information. The lived space is individual's knowledge of a space as they construct and feel it. The perceived space can be used to focus on the empirical materiality of library spaces, how big is it, how many chairs and so on. The conceived spaces allows focus on the flows within and through library spaces, such as the movement of users and books. The lived space allows focus on the inner subjectivity of each user and ultimately their understanding of libraries.

Modern Academic Library

There are three main developments within modern academic libraries: Technology, Learning Spaces and Development of New

Support Services. Each of these aspects is an important part of modern academic library as such services and facilities attract users into libraries and away from alternative learning spaces. Modern libraries much therefore work harder to engage users with a new concept of academic libraries such as technology centres, learning spaces and support hubs as well as resource collections.

Technology

Using technology such as wall to wall WiFi, quality printing, computing and extensive power outlet availability has become "ubiquitous" within libraries. While access to such technology drew users towards libraries, it is a bare minimum and something that user expect. Technology has also created new ways for people to communicate and some libraries tend to engage with social media to meet user expectations and engage with new demographics.

Technology has also shifted the boundaries of traditional library. Earlier, libraries were contained by their physical building but the advent of electronic collections and resources has changed this by enabling users to access library collections and resources at distance via INTERNET. Technology has eroded the position of libraries as an Information provider. Earlier, academic libraries had no competition but Internet has provided alternative resources and libraries now need to compare with other libraries and market their positions.

Learning Spaces

User demand and requirements for library spaces have changed since 1960. In 1960, a study of University facilities identified availability of space, lighting, temperature, ventilation, comfort of furniture, noise level, cleanliness, crowdedness and freedom of distraction as the important aspects of the library study spaces. This shows importance of environmental control within libraries as they ensure users are comfortable. All these requirements are now obsolete due to technological and societal changes. Requirements have changed. Now user have their own

specific requirements related to their skill level, programme of study and experience. Flexibility is a crucial aspect of modern libraries to ensure that they can accommodate variety of needs of their users. It is important for libraries to ensure that users understand how spaces should be used, especially if they are "new spaces" that people may not have engaged with before.

Development of New Support Services

The current phase of academic library development is "learner centred". This reflects similar development across the library where move is towards a "customer centred" approach. The majority of academic libraries have become known more their learning spaces and facilities than for their collection. This is an important shift for libraries as it suggests a change in the metric of their success. Both libraries and librarians have had to change rapidly to maintain relevancy.

Despite the "learner" or "customer" focus of libraries, it is difficult to support library users, as they are not a homogeneous group and are now more diverse than ever before. For this reason, libraries have increased the learning support they offer as the focus on learning spaces increases. Often, the development of such support is going beyond traditional library services due to extended opening hours and central location of many libraries.

Information Commons and Learning or Academic Commons

New kinds of information and learning spaces of academic libraries shall be such as Information Commons and Learning or Academic Commons.

Information Commons emerged in the 1990s as Computer Lab introduced into library spaces. The Information Commons is a brand combined library, learning and computing space in one building. With facilities such as study spaces, book and IT resources, the Information Commons possesses the utility of a library., yet the name is a conscious step to disassociate the building from

libraries. Including technology enhanced learning spaces, digital literacy support and flexible learning environments, the Commons provide many features usually associated with modern academic libraries.

Academic libraries now have to be "all things to all people" and this has led to the creation of academic or learning Commons. It can be defined as a learning commons as "a full-service learning, research, and project space". By combining social spaces with academic spaces, learning spaces happens as a "by product of socialising" also promoting interdisciplinary. Indeed *Academic commons are the end point for academic libraries*. In *future academic commons* will no longer repositories for information but spaces designed to enhance student learning and facilitate collaboration.

These Commons are very different spaces to traditional academic libraries. It can be argued that the reconceptualization of libraries is the academic Commons itself. If the idea and concept of a library is to exist, it is important for libraries to continue to play significant roles within academic commons.

Conclusion

Academic libraries have work hard to stay relevant. Despite this, the concept of a library is at risk. This is because while the substantial changes have seen libraries develop into multifunctional learning environments, the concept of a library has lingered. While this is not surprising due to the way users develop their own concept of libraries, it does demonstrate that libraries need to work harder to engage users.

Information, academic and learning commons have provided libraries with a new opportunity to conceptualise student learning spaces and support. If anything, the reconceptualization of the library is the academic commons. These commons represent an opportunity for libraries to break free from old ideas and labels, providing the chance to create something new without the trappings of older concepts. The strength of the academic commons is that

by name, it is something new and as such provides users with no previous concepts on which they could base their understanding. Central library of Tezpur University is also working hard to stay relevant. Substantial changes have already been taken place and planning for more changes. Please visit the website of Central library at <http://www.tezu.ernet.in/library> which is more than just a building and book repository.

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Resource Discovery Tool

Bhabananda Das

Abstract: Resources Discovery tool is a new release and basically a Google like search engine with simple box search facilities with additional search option by users. It has single box search facilities with primary and secondary interfaces and gives out multiple search results presented in a logical way of search resources. The scenario of the Library & Information development is tremendously affected by continuous new innovative of ideas, concepts from the Information Communication Technology. It is a better journey of the development of the information retrieval procedure from traditional Dictionary Catalogue to OPAC and Resource Discovery. Discovery tool is a powerful tool for information retrieval which will be replacing the OPAC in near future, and users recognized as the Next Generation Catalogue tools for information and knowledge discovery. Discovery services differ from federated search technique and discovery services don't search live sources, but search in pre-indexed metadata and /or full text document. By searching pre-indexed data discovery services return search results very quickly. Accuracy, relevancy, format of documents are one of big questions for all search engine, but in discovery tool different feature like format, accuracy, relevancy of documents, contents display are nicely incorporated. The developmental process is a continuous process, so, toady development in discovery tools is not an ultimate one. Innovation of the new idea and developmental process is continuously going on in the field of Resource Discovery. In this article basic concept, idea, features and categories of Resource Discovery Tools are briefly discussed.

Keywords: Discovery Tool; Search Engine; Federated Search; Google; OPAC; Interface; Unified index; World Wide Web Consortium; WordCat; MARC; RDA; Catalogue.

What is a Resource Discovery Tool? :

Resource Discovery tool is basically a search engine, just a Google like simple box search facility with additional search option by users, guidance for secondary search interface and give out multiple search results presented in a logical way of search information. A discovery service is a search interface to pre-indexed metadata and/or full text documents. Discovery services differ from federated search applications in that discovery services don't search live sources. By searching pre-indexed data discovery services return search results very quickly. Discovery services are touted as an evolution beyond federated search and in some ways they are. Some discovery services either provide integration with federated search or provide an API for others to do the integration. I believe that hybrid "federated discovery" services are likely to prevail over pure discovery services and I will dedicate an article to them.¹

The tired, worn public access catalogs are giving way to the newest technology, the discovery tool. Discovery tools are most frequently defined by the term— web scale— due to the formidable quantity of information presented. Teets (2009 as cited (Johns-Smith, 2012)) defines web-scale as — a system which is Highly Available, Reliable, Transparent, High Performance, Scalable, Accessible, Secure, Usable, and Inexpensive. In the context of discovery tools, web-scale discovery is more appropriately defined as— a link between the information user and the platform on or location at which the information resides, [providing] a single search box interface to pre-indexed metadata and/or full-text, intended to provide users with a simple, fast, and easy "Google-like" search experience; to provide librarians with increased awareness and usage of their holdings; and to provide content providers with an opportunity for increased usage, especially by inexperienced

searchers, and with a distribution channel that can broaden their brand awareness (NFAIS, 2011 as cited (Johns-Smith, 2012)).

According to Denholm et al (2008) as cited by Johns-Smith (2012), Discovery search tool are different from other federated search tools that generally using pre-indexed metadata and content, much of it full-text, which provides significantly larger result sets in ?internet time, using the pre-indexing to achieve rapid results with little delay time. As the story goes, discovery tools are for finding, not just for searching, and certainly not for watching a complicated Boolean query grind under an hour glass.

Discovery Tool Vs Federated Search Tool

Traditionally library information systems, such as library catalogs and databases, metadata, are referred to as search systems. Search systems offer structured search interfaces that are tailored to the specific data that they hold; the records are homogenous-they are cataloged in the same way, have the same data structure, and often relate to one topic (as in a subject related database). Search systems typically expect users to possess medium-to-high searching literacy and enable users to accurately define their information need. Although in recent years such systems have also simplified their search interface and incorporated post-search refinement options, librarians encourage users to develop searching strategies and take advantage of the rich options of the systems' search interface. Library discovery systems, despite some differences between them, share several major characteristics (Sadeh, 2013).

Search Tools. This term often is used in a generic way to refer to multiple types of internal or external search engines, directories and information archives. Most search tools are usually designed to interact with a computer program - often a crawler, spider, indexing both or similar system - that was created to retrieve documents or data. The crawler and its associated search tools can be set up to interact with one specific database, a set of databases, a single computer network or even the full Internet.

When using such tools, searches often are based on a keyword, set of keywords, or a phrase that can be contained in one of the files that was indexed by the spider. Doing a simple keyword search may be useful, unless there is ambiguity about the meaning of the term. For example, if you search for the word "Saturn," do you mean the planet, car, rocket, or old Sega Saturn game console? To help resolve ambiguity, some search engines also collect information from a file's metadata fields. Metadata can be useful for setting the context of a keyword. If metadata indicates that a file contains information about the solar system and planets, a good search engine would assume that any matching keywords in that file refer to Saturn the planet, not Saturn the car brand. But what if someone searching for Saturn the planet doesn't remember the name of the planet? Or what if they are looking for information about planets in general and they simply enter the name Saturn as one example? What they really need is more guidance built into their search results.²

Resource Discovery Tools : Basically discovery tools and search have no major difference because both are search engines to search the information in web. The only difference is that the Discovery tools has the additional searching facilities, multiple search result , multiple file format, accuracy, relevancy and additional choices of search features as per users needs. Some discovery tools are very simple just like Google Search engine that only multiple search results are arranged in a logical indexing order.

A basic example of a discovery tool is the "Spell check / Did you mean" feature that Google presents if you misspell a search term. Besides executing a keyword search, Google's search system also looks through a database of common misspellings. If it finds a match, the search result page helps you discover a correct spelling. But it doesn't automatically assume you meant the correct spelling. So it still offers keyword matches for the misspelled version of your word. Discovery tools can help refine your search or ask questions to help you make additional search decisions. Two excellent examples include the Recent Activity boxes on eBay or

the "People who bought this book also bought" links on Amazon.com or Barnes and Noble's Web site. By tapping other databases and not just their own index of keywords and matches, those sites make fairly accurate predictions about other things that you might be looking for. Information discovery should not be confused with semantics. In general, semantics means identifying the meaning of a word or phrase, and the Semantic Web³ efforts championed by the World Wide Web Consortium have made great strides in helping people understand this issue.⁴

From the above, it can be said that semantic approach of search is not perfect solution for retrieving the information search by user that he don't the exact word or search term to be search. In that condition a discovery tool may help you choice the exact word or search terms from the option display by the tool during the search period. This is similar to Google's search for misspell and "Did you mean" feature, but significantly expanded too many different conduits of information and accurate spell-check option to refine the choice. Basically Information Discovery interface concern with availabilities of path, context and pattern of matching with the search term. So, discovery tools may be present in a small search results with two or three matching choices, plus a suggestion with a link or path for future search of related documents. This result may help you discover other paths and link to refine the search for more accurate information. Discovery tools present the various paths that have been enabled for you in the search results. Possible examples: Pull-down menus that define the age of truck, people who live in apartment buildings, the age of truck owners, and so on. Truly flexible discovery tools let you follow one path and then adjust settings without needing to start your search over again - such as expanding your search to 20 miles or limiting results.⁵

Discovery Components: The Discovery tools are new release to library science and innovation and development is going on continuously. Many new features are adding continuously and every day new concept, innovations of new idea are added and

categories and components of the tools also increased day by day. But following are certain basic components of the Discovery tools discussed here. .

Discovery Interface

According to Breeding (2015) Discovery Interface, originally marketed as "next-generation catalogs," emerged to provide a more modern replacement to online public access catalog (OPAC) modules of Integrated Library Systems (ILS). Discoveries provide a flexible and most improved end-user interface by specific information seekers for multiple search result in a single search. A discovery interface includes features such as relevancy-based search results, faceted navigation, and other features consistent with web-based resources.

1. End-User Interface is performed via a web browser by entering the search term in single box queries for targeting the multiple results in different form like full text, abstract, images etc.
2. Interoperability with a link resolver to present links to full text from citation records in search results.
3. Local search and retrieve is possible through unified indexing system using the local server like Apache SOLR^{TM6}
4. Ability to interactively communicate with the library's automation software for current availability status of library holding and other details.
5. Access to remote index platforms via Application Programming Interface (API) in addition to, or instead of, targeting search queries and receiving results from a local index.

Some Feature of Discovery Tool:

Single Stop Searching for all Resources: This is most essential and common feature of a good Discovery tools and can retrieve articles and information from databases & digital repositories along with books, videos, audio-files, images. Some

Discovery tools retrieved live data from databases during the real-time search and some discovery tool build a single index file to display the retrieved resources. The accuracy of data retrieve from the local libraries is based on the send and update of the databases of local libraries to vendor databases (knowledge databases) because indexing of the data for single unified index⁷ is bases on the update of the knowledge databases. Both the real-time search and federated search (single unified index) is depended on permission of the contents providers for indexing and displaying the research result. So, it has limitation to retrieve and indexing the search result. Some discovery tools like VuFind has not their own unified index or real-time searching capability, but provides web-scale searching by developing the connectors to Application Programming Interface (APIs) to serials Solutions or OCLC and retrieved result from Summon and WordCat Local. In this way these discovery tools can retrieve all most 100% search result by Web-scale searching from various location, but 100% search result is not possible in case of any Internet Search engines including Yahoo, Google or Google Scholar etc. Therefore, web-scale searching is more reliable and efficient than other possibility. Therefore, discovery tools provided users a simple way to quick retrieval of large number of resources in multiple formats which is highly encouraged to future in-depth research in this field (Chichring & Yang, 2014).

Enriched Content: Display of enriched contents of a search item is essential feature of a discovery tool. All Discovery tools display the content of search item with cover images or video jacket images, content of journal, user-supplied or commercially available reviews, comments, blogs, links to resources etc.

Faceted Navigation: Faceted navigation allows users to further divide and choice the option of search into subsets of predetermined search term. Faceted navigation of search term is standard feature and integral part of discovery tool and facets terms are mostly derived from the MARC records and knowledge database of vendors. The most commonly used faceted terms are author,

title, subject, keyword, publication date, location, language and type of collection. Faceted navigation search of discovery tool is a highly flexible one and allow to configure as requirement of own facet of a particular library (Chichring & Yang, 2014).

Simple Keyword Search Box: The discovery tool search box is Google like simple search box allowed keyword search with link to advanced search at the starting page and subsequent pages in every navigation. Some Discovery tools are very flexible design for choosing the option search as per need of the libraries. Search Box of some Discovery tools not only flexible with search option, but it can easily configure as per library need like dropdown menu, radio bottoms of the search keywords, authors, titles, publishers, types of documents, location and availability in a library. The Simple keyword search is a unique feature of the discovery tool as like simple search box of Google, but not limited as like Google search and it has multiple search options for search.

Relevancy- Relevance means how well a **retrieved** information or set of documents relevant to as per users need. This is one of the basic and crucial features of discovery tools. This is mainly base on computer algorithm, search option and configuration of the search strategies. Some discovery tool like Ex-Libris have special feature that can arrange the retrieved information on the basis of the popularities of the documents retrieved (Chichring & Yang, 2014).

Spell Checker/"Did you mean . . . ?"-Spell Checker is a provision of checking misspelling of search term of any Discovery tools. The common misspell checking query is , " Did you mean..?". Misspell checking query may be different as per the variation of the discovery tools. Some these misspell checking queries are very user friendly as per language of the users of a particular libraries. A local developer can easily installed and configure a dictionary or spell checker as per local libraries need even if a discovery tool does not come with one out of the box (Chichring & Yang, 2014). This feature may be easily configurable and can added additional feature including languages and local

library interest. In addition to (Breeding, 2015) the misspell checker, the most of the Discovery tools made recommendations based on the searching behavior and contents available in knowledge databases. However, most discovery tools do not have a recommendation system. Instead, they have adopted different approaches. Most discovery tools make recommendations from bibliographic data in MARC records such as subject headings for similar items. Primo is one of the few discovery tools with a recommendation system similar to those used by Amazon and other Internet commercial Sites. bX is an excellent example that discovery tools can suggest new leads and directions for scholars in their research. The authors counted all the discovery tools that provide some kind of recommendations regardless of their technological approaches using MARC data or algorithms (Chichring & Yang, 2014).

User Addition of Bibliographic Data: Generally bibliographic data of libraries are inputted, edit, controlled and safely guarded by every librarian in their library database. But in digital age the concept of bibliographic data management and maintenance is changed and can contribute the bibliographic data by user to the library databases with due permission of the authority of the bibliographic database controller. This is one of the important features of discovery tools and some provide this feature for improving the bibliographic data. But there is provision of censorship by bibliographic controlling authority before publishing the data for public use.

RSS Feed/Email Alerts: RSS feed means the automatically sending a list of new e-resources to user email address base on the users searching criteria. It can remark as the email alerts for the e-resources in users' field of interest (Chichring & Yang, 2014). This feature can automatically send a list of new library resources to users based on his or her search criteria. It can be useful for experienced researchers or frequent library users. Some discovery tools may use email alerts as well. An RSS feed can be added as a plug-in in some discovery tools if it does not come as part of the base system.

Integration with Social Networking Sites: Social network site like Facebooks, Twitter, Delicious are most common and popular among the young generations there they share the e-resources of their interest. Social networking integration is very common feature of the discovery tools and users can place easily the link to slected resources by clicking on the icon of the discovery tools.

Persistent Link : This is also called permanent link or permURL. Not all the links displayed in a browser location box are persistent links, therefore some discovery tools specifically provide a link in the records for users to copy and keep. The authors marked a system as "No" when a permanent link is not prominently displayed in a discovery tool. In other words, only those discovery tools that explicitly provide a persistent link are counted as "Yes." However, the URL in a browser's location box during the display of a record may serve as a persistent link in some cases (Chichring & Yang, 2014).

Auto-completion/Stemming: Auto-complete/stemming is one of the essential features of any search engine or the discovery tools. When a user types or input a searchable term in the search box, the discovery tool will supply a list of words or phrases that she or he can choose readily. This is a highly useful feature that Google excels at. Stemming not only automatically completes the spelling of a keyword, but also supplies a list of phrases that point to existing items.

Mobile Interface-Today, the use of mobile phone is a very common phenomenon and the inseparable part of every-day life of each human being. It is very powerful device to reach the information to ordinary people. Use of mobile device to retrieve the information and e-resources is very common. Mobile compability and designing of the discover tools to enable the interface mobile is a very essential feature of a discovery tools. A mobile interface means the simplified version of a normal browser of discovery tools to enable the access to retrieve the information. Some discovery tools automatically mobile compatible and does not

need the separate browsing system to interface the mobile device, but some discovery tools have separate mobile interface browser to interface the mobile devices. But most the discovery tools are automatic mobile compatible that can use in mobile phone friendly.

Functional Requirements for Bibliographic Records:

FRBR is a conceptual entity-relationship model developed by the International Federation of Library Associations and Institutions (IFLA) that relates user tasks of retrieval and access in online library catalogues and bibliographic databases from a user's perspective. It represents a more holistic approach to retrieval and access as the relationships between the entities provide links to navigate through the hierarchy of relationships.⁸ FRBR groupings feature is interesting in discovery tools that denote the relationships between the resources, manifestation, expression, interlinks of resources and hierarchy of relationships of Resources. For instance, a search will not only retrieve a title, but different author works, editions and formats of the work. Some discovery tools like eXtensible Catalog (open source), Primo by Ex Libris, and Worldcat Local by OCLC can display relationships in hierarchical manner (Chichring & Yang, 2014).

Categories of Discovery Tools: Generally on the basis of the production license, the discovery tools are categorized into Open source and Commercial product.

Commercial Discovery Tools:

Ex Libris® Primo® : Ex Libris began development of its next-generation discovery layer, Primo, in 2005, with official public release occurring in 2007; Primo version 3 was released in spring 2010. The Primo discovery platform harvests and indexes local library collections, such as bibliographic records, digital collection materials, and items within institutional repositories, and provides a common interface for discovery of these materials. In addition, Primo can be configured to search remote repository indexes and blend the library's local collections with the remote index results

(Vaughan, 2011). A new-generation interface is to provide relevancy based search for materials managed by a library's integrated library system, local content repositories, and other collections of interest that might be available for local indexing via the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) or batch record loading. Ex Libris later developed Primo Central as a managed central index of scholarly content. Primo uses Apache Lucene or SOLR as its technology for managing local indexes (Breeding, 2015).

SirsiDynix® Enterprise®: SirsiDynix® Enterprise® is also United State companies develop library software and provided discovery service with a platform for relevancy-based retrieval and faceted navigation for the content managed in a library's integrated library system. SirsiDynix Portfolio™ extends the platform with a digital contents management with enable for the local contents management from local server. It is a browser-based system that will integrate SirsiDynix's "administration, discovery, acquisition, and collection management applications." It can be accessed from a desktop, laptop, tablet or smart phone⁹

BiblioCommons: BiblioCommons is a private company provided web services for libraries which online catalogue module BiblioCore provide discovery service integrates with existing Integrated library systems (ILSs) and creates a complete OPAC replacement that features intuitive searching, account integration, new tools for discovery of resources. Discovery service relevancy-based retrieval, faceted navigation, and a variety of social and community-oriented features relevancy-based retrieval, faceted navigation, and a variety of social and community-oriented features (Breeding, 2015).

ProQuest® AquaBrowser® Library: The AquaBrowser® discovery layer provides a fresh interface with a single search box, allowing users to quickly find relevant results. A unique "search, discover, refine" methodology helps users quickly and easily find the resources they are looking for¹⁰. It provides an end-user index with faceted navigation and a cloud of search terms

extracted from search results and rewarding for common search behaviours. Aqua Browser retrieved the rich contents from local server users can engage for contribution of cataloging data and contents through the build-in My Discoveries from social Networking experience.

EBSCO Discovery Service: EDS provides a fast, streamlined search through a single search box, but within the context of a greater experience that pulls together intuitive features and functionality, high-end indexing via Inclusion of Subject Indexes, and instant access to critical full text, leveraged from the leading EBSCOhost research platform and databases, as well as from key information providers. And as EDS continues to evolve, the end goal remains the same—helping users to find and access the highest-quality content for the best-possible research experience¹¹.

Innovative Interfaces Encore: It was developed by Innovative Interfaces Inc. Company in 2006 for replacement of online catalogue of Millennium or Sierra with features single search box, faceted navigation and indexing on relevancy of information resources. Encore was originally designed for work with integration the Integrated Library Management System, but later it was converted to discovery service with facilities to retrieve e-resources, e-book, and other library resources (Breeding, 2015).

Open Source Examples of Discovery Tools:

Blacklight, originally developed by the University of Virginia, based on a Ruby on Rails programming framework and Apache SOLR indexing, search, and retrieval technology. Blacklight provides a flexible toolkit for a wide variety of record types and is the predominant search interface to the Hydra Project digital asset management system (Breeding, 2015).

VuFind: VuFind is an open-source, next-generation catalog overlay system developed by Villanova University Library that was released to the public as beta in 2007 and version 1.0 in 2008 (Emanuel, 2011). VuFind is based on a PHP programming¹² codex and Apache SOLR indexing search and retrieval

technology. VuFind is a more user friendly and faster version of the library catalogue.

eXtensible Catalog, : The eXtensible Catalog (XC) is a set of open source software tools and metadata schema designed to facilitate library metadata management and resource discovery. a research project launched in April 2006 by the River Campus Libraries of the University of Rochester, with funding from the Andrew W. Mellon foundation, has created a number of tools that complement the development of discovery products and services (Breeding, 2015). XC software is supported and maintained by the not for profit eXtensible Catalog Organization (XCO). XC software represents the first live implementation of a subset of RDA¹³ in a FRBR-based, non-MARC environment. XC's implementation of RDA has been led by individuals who have participated in the development of both the RDA Toolkit and the RDA vocabulary registry. XC's use of RDA has also been informed by the real world requirements of actual working software, as well as through a user research process conducted at four ARL libraries (Bowen & Lindahl).

Franklin: It is a local discovery interface developed by the University of Pennsylvania Libraries, which is not based on Blacklight or VuFind (Breeding, 2015). This discovery tool searches both the catalogue and full-text resources (journal articles, newspapers, ebooks, and more). Search result display in two columns, with catalogue entries on the left and Articles + results on the right.

Conclusion:

The concept of library and Information Science is frequently developed with the innovation of new technologies especially development of IT sector enormously affected on its development. Resource Discovery tool and Discovery services is new release innovated to Library and Information Services are constantly trying to improve the quality of services with innovation of new concept, ideas , and feature. So, today Scenario of the Discovery tools

development is not ultimate, because, development process is a continuous phenomenon and have more folding window to develop in this field especially in the feature of retrieve, relevancy, display and indexing of the information resources. Discovery tools constantly improve and evolve, and many features are not included in this evaluation, such as integration with Google Maps for the location of an item and user-driven acquisition. But still now Discovery tool is not popularly use by user as search tools as like common people user the Google search engine and other federated search engine. Training and awareness among both users and library professionals is most essential for popularity of the tools and right choice of the search tools and devices. ♦

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Note

- 1 Discovering Discovery Service . <http://federatedsearchblog.com/2009/07/19/discovering-discovery-services>
- 2 Why you should know the difference between search tools and discovery tools. <https://gcn.com/articles/2010/05/03/internaut-search-discovery-tools.aspx>
- 3 Semantic Web. Available at https://en.wikipedia.org/wiki/Semantic_Web.
The Semantic Web is an extension of the Web through standards by the World Wide Web Consortium (W3C). The standards promote common data formats and exchange protocols on the Web, most fundamentally the Resource Description Framework (RDF). According to the W3C, "The Semantic Web provides a common framework that allows data

to be shared and reused across application, enterprise, and community boundaries". The term was coined by Tim Berners-Lee for a web of data that can be processed by machines. While its critics have questioned its feasibility, proponents argue that applications in industry, biology and human sciences research have already proven the validity of the original concept.

- 4 Why you should know the difference between search tools and discovery tools. <https://gcn.com/articles/2010/05/03/internaut-search-discovery-tools.aspx>.
- 5 Why you should know the difference between search tools and discovery tools. <https://gcn.com/articles/2010/05/03/internaut-search-discovery-tools.aspx>
- 6 Apache Solr . available in https://en.wikipedia.org/wiki/Apache_Solr
Apache Solr (pronounced "solar") is an open source enterprise search platform, written in Java, from the Apache Lucene project. Its major features include full-text search, hit highlighting, faceted search, real-time indexing, dynamic clustering, database integration, NoSQL features and rich document (e.g., Word, PDF) handling. Providing distributed search and index replication, Solr is designed for scalability and fault tolerance. Solr is the second-most popular enterprise search engine after Elastic search.
- 7 What is a unified Search Index? <http://federatedsearchblog.com/2009/07/19/discovering-discovery-services/>
The terms "unified index" and "unified search index" are associated with discovery services. Just as the terms imply, discovery services use a unified search index to search content from all sources they have access to from a single index. The discovery service must deal with differences in the structure of meta data (e.g. names and contents of fields) from different sources to produce the unified search index.
- 8 https://en.wikipedia.org/wiki/Functional_Requirements_for_Bibliographic_Records
- 9 <https://en.wikipedia.org/wiki/SirsiDynix>
- 10 <http://www.proquest.com/products-services/>

AquaBrowser.html

- 11 A Full-Featured User Experience. <https://www.ebscohost.com/discovery/user-experience/eds-features-functionality>
- 12 PHP . available at <https://en.wikipedia.org/wiki/PHP>
PHP : PHP originally stood for Personal Home Page, but it now stands for the recursive acronym HP: Hypertext Preprocessor. PHP is a server-side scripting language designed primarily for web development but also used as a general-purpose programming language. PHP code may be embedded into HTML or HTML5 markup, or it can be used in combination with various web template systems, web content management systems and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in the web server or as a Common Gateway Interface (CGI) executable. The web server software combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the generated web page
- 13 RDA : available at https://en.wikipedia.org/wiki/Resource_Description_and_Access
RDA : RDA : Resource Description and Access (RDA) is a standard for descriptive cataloging initially released in June 2010, providing instructions and guidelines on formulating bibliographic data. RDA is the successor to Anglo-American Cataloguing Rules, Second Edition (AACR2). RDA is a package of data elements, guidelines, and instructions for creating library and cultural heritage resource metadata that are well-formed according to international models for user-focussed linked data applications.

Documentation Services in College Libraries with reference to IT Environment

Rubi Baishya

Introduction

Information is a vital commodity for planning, decision making, developing, monitoring, evaluating and implementing programme in our life. It is one of the most important elements for conducting research and studies. Availability of right information to right person at the right time and right form is a precondition for any decision making process.

With the tremendous growth of knowledge and wide variety of information available, it has been presently difficult for the users to keep themselves up to date. This problem can be overcome with proper keys or aids to access the vast amount of available information. In this context documentation services is one of the key areas of concern to the library service in modern age of information explosion which is denoted by the term information overburden.

It is important for library and information professionals to search for some better techniques to organize and dissemination of information service to the users sufficiently, exhaustively and precisely. It is felt that the conventional tools and techniques for documentation could not thrive to ensure the information needs of today's age, hence, needs an evaluation and reassessment so that

necessary interpretations may be made. The challenge of organizing information irrespective of sources and form, irrespective of language and geographic boundaries; together posed a challenge before the library professional to strive with situation; which argue the need for searching certain innovative technique of documentation.

Documentation is the art or an instance of supplying of documents. Documentation work and services by its definition and scope cover all the activities and services practised to make a specialized users or group of users abreast with the recent developments in his/her or their specialization. The selection of precise information, its logical organization and the extension of the information flow to the right users is the matter of great concern in librarianship. Documentation is necessary in college libraries to keep themselves up-to-date with the development all over the world. Efficient documentation is not only most essential but also basic necessity. Any piece of information that is not reached to its right users in right time loses its value.

The term documentation refers to two sets of activities. (Guha, 1983). One set of activities is for the analysis of literature known as active documentation. The other set of activities is for search and location of information and the final provision of the information or the information bearing documents, which is also called by alternative name of passive documentation. Another alternative way of labelling the two sets of activities is referred to as documentation works and documentation services respectively. The essential characteristics of documentation works is that they are carried out in anticipation of demand. And the essential characteristics of documentation services are that they are carried out in response to specific requests.

S.R.Ranganathan, defines "Documentation is the complex of processes involved in pinpointed, exhaustive and expeditious service of nascent micro thought to specialist" (Chatterjee : 1983 :10). According to him documentation lays stress on three aspect namely- a) nascent thought, far more than on old thought, b) micro

thoughts, c)specialist readers, far more than on general readers.

Documentation Services

Documentation service is one of the important services that the libraries are to give emphasis. Earlier the problem of documents was very limited. At present, the documents are produced in large numbers and in varieties of forms. So, it is not possible for the specialists and research workers to go through the all available literature and find out the pertinent information by themselves. Therefore, documentation service is required to identify, collect, organize and disseminate relevant information which are scattered in various documents so that these are readily available for effective use.

A number of documentation services are provided by special library as it is for specialized readers on nascent thought from micro literature. But documentation services should form an important part in college libraries in order to suit needs of different types of users. For this purpose proper planning is necessary.

Types of Documentation Services

- ◆ Current Awareness Services (CAS)
- ◆ Selective Dissemination of Information (SDI) Service
- ◆ Bibliographic Service
- ◆ Indexing and Abstracting Service
- ◆ Translation Service
- ◆ Document Delivery Service (DDS)
- ◆ Reprographic Service
- ◆ News Paper Clipping Service

Planning Documentation Service

A proper planning before it is implemented is essential to get the desired results. Accordingly, for introducing the documentation services in especially in the college libraries the following parameter needs to be considered at the planning level-

(a) Types of users and their Information Requirements

While planning documentation service for the users it should keep in mind the area of interest and informational needs of the users.

(b) Subject Coverage

Recognition of user's information needs identification of the users, and the obtaining or acquisition of relevant documents is vital factors which should be considered before the planning of documentation services in an organization.

(c) Services to be Extended

One of the primary aims of documentation service is putting the knowledge to work. In order to put the knowledge to work, not only one has to understand the characteristics of knowledge, but also to understand how knowledge is absorbed and assimilated, the motivation it induces and how it must be channelized for more effective utilization. Thus, dissemination of information is an important parameter in planning of documentation service and needs much attention. Towards this end, planning should be undertaken to see that whatever relevant information is presented, it should be in a digestible logical sequence and be easily assimilated.

(d) Staff Requirements

The process of planning involves following two phases (a) the identification of the user's needs and designing of appropriate service, (b) Execution of the services is to be undertaken rapidly and rationally. The execution of any plan will not take place if suitable strategy to ensure effective execution and optimum use of the available human and material resource is not evolved.

(e) Budget Provision

It is difficult to evolve patterns to identify expenditures, analyze cost and determine sources and ways of financing it, especially in relation to documentation services. For this it is necessary to maintain library statistics and it will provide careful planning data.

Apart from these parameters, the success of the planning of documentation service will depend mainly on -

- i. The technical knowledge and professional approach of the documentation.
- ii. Specification of the aims and objectives of documentation

services which in turn is based on the aims and objectives of the parent body.

- iii. A programme which directs the resources into action, *to realize the objectives.*
- iv. Resources.
- v. Development of proper relationship with all the beneficiaries of the documentation services, so that services can be evaluated and revised to meet the actual needs.

Use of ICT Devices in Extending Documentation Services

The day is the marked as the transitional period where traditional libraries and the electronic library are found to be in existence. In that situation, ICT devices are used to a large extent for availing sufficient benefits in working and services of a library establishment. The college libraries of Assam have witnessed a changing environment where ICT devices are being used in performing library jobs. Libraries are being automated, E resources are made available mainly through UGC consortia besides free online resource, in addition to some subscribed resources in some of the colleges.

The college libraries have also experienced the use of ICT devices in a deeper way. Different activities that were being performed manually have now been performed through automation. At the same way services are also been automated. It is in this context the documentation service which is one of the very important services in university library system need to be extended by using ICT devices.

Mention may be made here that bibliographic service, which is premier service of documentation service can be extended by using computers irrespective of users approach like author, title, subject, etc.

Again, the current awareness service like inform the users about latest collection printed and non- printed; books and journals can be extended using computers. This situation is also can be viewed in case of SDI service. Online information resources are

very much available in different college libraries by way of alert, email and such other new process services can be rendered with full satisfaction of users with almost no time required. The college libraries have now initiated the process of digitization of rare documents. A large number of select documents have digitized extension of documentation service, collecting resources from those digitized items which will be one of the very important parameter in the endower.

Planning of Documentation Services in College Libraries

In College library, generally we find different types of users and documentation service in a library provide to specific user or user group on nascent thought. It is not for all types of users. Therefore, there should be provision for a documentation centre in College library system so that it can satisfy the needs and requirements of special users such as faculty members of college and the students who are engaged in special projects. Moreover, there is the need of one efficient documentation officer for smooth running of the services of the documentation centre.

For planning of documentation service in College libraries in IT environment, following steps need to be considered -

i) Selection of items

First step is the selection of important items to be covered in documentation services.

ii) User profile

User profile should be consisted of his/ her full information like name, designation, specialization and also his interest area other than his/ her specialization. Once a particular document is received by library, the documentation section should match the document to a particular user or a grouped user. The information on the document is forwarded to him/ them expecting his/ their response, showing interest to the particular document on receipt of the interest by the user(s), the document centre should plan for sending the document, original form or Xerox form or by scanned copy. If the document is in digital form, it can be sent through e-mail.

iii) Document profile

After preparing user's profile documents should be scanned and a document profile be proposed.

iv) Comparing and Matching

After preparation of document profile and user profile, the next step is to compare and match both the profile. Matching of two files is concluded by computer at regular intervals. The result of matching is then saved as a file in the required format.

v) Notification

The next step should be issue of notification which may include communication of result to the users. Notification may be sent to the user through e-mail by attaching the result file or as a hard copy by obtaining print out of the result file (s).

vi) Feedback from users

Feedback gathering is another step in case of providing documentation service. For that purpose a feedback form should be sent to each user along with the notification in which he/ she has to indicate whether the document really interested him/ her, whether he/ she needs a copy or why it is of the interest to him/ her. After receiving feedback from users, they should be analyzed.

vii) Evaluation

The system should be evaluated periodically. For this purpose following points should be considered -

a) Available documents

The first criterion for evaluating the system is to evaluate the documents available in library. It emphasizes that whether the documents are available in library according to users demand. It is necessary on the part of the librarian to check from time to time whether the micro documents are subscribed or not based on user's needs.

b) User Profile

It consists of user name, designation, specialization and area of interest. So, in such case evaluation of user profile include evaluating whether, the users had changed their field of interest or add something new to their profile. It is necessary because it

will help to provide needed information to users according to their interest.

c) **Planning of documentation service section**

Evaluation of planning of documentation service section should be made on the basis of following criteria:

- ♦ **Collection Development:** The heart of the library lies in its collection. Collection development is the first and foremost function of any library and documentation centre. Collection development includes all such activities as assessing the user needs, evaluating the present collection, deterring the selection policy, co-coordinating, the selection of items, re-evaluating and storing parts of the collection, and planning for resource sharing. So in each documentation centre, in a library, collection development is must for providing services to its users.
- ♦ **Arrangement:** Arrangement means arrangement of documents, materials etc. Evaluation of arrangement implies to check whether in documentation centre all the arrangements are made properly keeping in mind users interest and their requirements.
- ♦ **Proper recording:** It means maintenance of bibliographic records of documents, which are acquired for providing documentation services. Records are maintained in the basis of subject area and area of interest of users.
- ♦ **Awareness:** In case of library, awareness generally implies awareness of users and library professional regarding documentation services. So, its evaluation includes how far they are awake and up-to-date with the nascent thought of their area of interest.
- ♦ **Facilities:** It implies to check the availability of needed facilities in the documentation centre like

Xeroxing, e-mail, scanning etc. in order to satisfy the demand of users.

- ♦ **Staff :** For proper functioning of documentation centre and to provide best services to the users, appointment of staff is an important criterion. So, keeping in view, this evaluation should be made whether sufficient staff is available or not for proper maintenance of documentation services in order to satisfy the diverse need of users.
- ♦ **Management:** Success of documentation service depends on its proper management. Management implies management of human resource, materials, documents, records of document, software, hardware management which can be used for providing documentation services.

c) Gap between receipt of request and sending of the document and information:

It implies the time interval between receipt of request sent by the users and sending the needed information and document to the user from documentation centre. The time gap of receipt and delivery of information should be as minimum as possible in order to develop confidence on the services extended.

viii) Modification

Response received from the users should be carefully analyzed and evaluating the different sports as mentioned above and if necessary modification should be made.

Conclusion

It is found that the literature growths in various formats are increasingly high. College libraries trying their best to procure such literature to what extent it is possible. At the same time because of use of ICT devices in different activities of college libraries and extending services properly documentation service is found to be very much essential. The standard of a library depends of

among others each documentation services.

A coordinate effort has to be initiated in the college libraries for introducing documentation service in proper format. Instead of centralized library, decentralized library is the present day needs. Users are demanding their requirements in their own location which should be very much selective also. Because of use of ICT devices and also internet use CAS, SDI, web OPAC, bibliography and some of the facilities those can be rendered in ones' desktop.

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Information Literacy for Sustainable Libraries in Digital Era : Study of Information Literacy Program of IIT and IIM Libraries

Neelam Thapa

Introduction

Knowledge Society is characterized by a dynamic, complex and information rich environment with ICT as the backbone. It is ever changing and to sustain in such a society one has to keep pace with time. Libraries have recognized this fact and are accordingly fast upgrading their infrastructure, resources and services. We are moving towards developing digital libraries with large e-databases and repositories and also providing varied services to satisfy varied user needs.

But, this alone will not guarantee the survival of libraries. Libraries will be able to survive if and only if they are able to retain their existing users and at the same time focus on increasing their user base and use of e-resources. This will be possible when libraries are able to connect users to their needed resources. Information Literacy (IL) is the tool that can help bridge this gap between users and resources.

Today, the user faces not the dearth of information but overload of information. Information is available in various forms and formats and from various sources. This creates doubt about the reliability and authenticity of the information. Choice of information source, search engine and the complexities of various search techniques also make accessing information an

uphill task for the user. These factors hinder users from accessing the right information.

IL is the "Skill in finding the information one needs, including an understanding of how libraries are organized, familiarity with the resources they provide (including information formats and automated search tools), and knowledge of commonly used research techniques. The concept also includes the skill required to critically evaluate information content and employ it effectively, as well as an understanding of the technological infrastructure on which information transmission is based, including its social, political, and cultural context and impact" (Online Dictionary of Library and Information Science).

IL is an amalgamation of different literacy like Internet literacy, research literacy, media literacy, library literacy, etc. It enables users to become aware, independent and intelligent users of information. IL teaches to "learn to learn". IL is recognized as a key requisite for academic pursuit and research.

Information Literacy: Role of Libraries and Library Professionals

Libraries have always played a pivotal role in human progress by preserving and serving knowledge and information across frontiers. But unfortunately, as correctly stated by Singh and Dilara Begum (2012), the students of today rely more on Internet than on libraries for their information needs. They think Google has answers to all their questions. But this is not true.

Access to vast amounts of information is not the whole answer. The power to discover the right information quickly and easily, to separate nice to know from need to know information is essential, if superhighway users do not drown in electronic junk information. An information flood does not necessarily mean that people become informed (Kehoe, 1993).

So, users have to be taught how to retrieve correct information quickly, analyze it and use it ethically and communicate it effectively. Libraries and librarians can perform this task of

educating users efficiently because they understand the intricacies and complexities of information storage and retrieval. Also, they have always been conducting programs on user orientation and bibliographic instruction. But, we have to keep in mind that with the development in ICT and increased impetus on research, user needs have changed and we have to also change our instruction programs accordingly. We have to enrich our instruction programs by moving beyond library literacy and including digital literacy, media literacy, research literacy, etc. Breivik (2005) emphasizes on implementation of Information Literacy to teach students critical thinking skills that will help them determine when and where to find information and how to identify, access, evaluate and effectively use that information.

Also, students need to move beyond their academic assignments for being able to complete research for the world of work. If institutes of higher education are to prepare graduates to be world-class professionals, then we must place information literacy skills at the core of instruction in every discipline. This can be best accomplished when librarians in collaborations with classroom faculty infuse information literacy instruction into and across the curriculum (Singh and Dilara Begum, 2012). Breivik (2005) also opines that to be successful in preparing today's students for lifelong learning in the 21st century, there must be an unprecedented cooperative effort between higher education and the schools to incorporate Information Literacy skills into the basic curriculum - starting in kindergarten.

The importance of a library for academic development and research can be well understood from the statement of the Nobel laureate and Hungarian Biochemist Albert SzentGyorgyi who says "I could find more knowledge new to me in an hour's time spent in the library than I would find at my work bench in a month or a year" (Denis Grogan, Ed., 1976). It is also appropriate to quote here what Loeb (1923) has stated as far back as 1923, regarding the importance of the library, "Real discoveries are actually made

in the library and subsequently tested out in the laboratory."

Objective of Research

Keeping the importance of IL and the pivotal role that libraries play in imparting IL, the present study has been taken up to study the Information Literacy Program (ILP) being implemented by the libraries of IITs and IIMs. The study aims to understand the suitability of the program, its limitations and the problems faced by the librarians in its implementation. It also aims to provide suggestions based on the findings.

Scope of Study

There are 16 Indian Institutes of Technology (IITs) and 19 Indian Institutes of Management (IIMs) in India. Out of these, 7 IITs and 6 IIMs have been included in the study.

The new IITs and IIMs established after 2008-09 are still in the process of developing infrastructure and establishing themselves and so have not been included in the study.

Research Methodology

The study is a survey based on questionnaire as the tool for data collection. A structured questionnaire was administered to all the 13 libraries i.e. 7 IIT and 6 IIM libraries under the scope of study. The data thus collected was tabulated and analyzed to draw the inferences. The suggestions are based on these inferences.

Data Analysis

The response of the respondents is tabulated below and findings have been drawn from the analysis of this data.

Table 1. Number of Libraries Conducting ILP

Type of Institution	Total Number of Libraries	ILP		
		Conducted	Not Conducted	No Response
IITs	07	05 (71.42%)	01 (14.29%)	01 (14.29%)
IIMs	06	04 (66.67%)	Nil	02 (33.33%)
Total	13	09 (69.23%)	01 (7.70%)	03 (23.07%)

Table 1 shows that out of 7 IIT libraries, 05 (71.42%) libraries conduct ILP, 01 (14.29%) library does not conduct ILP and 01 (14.29%) library did not respond to the questionnaire. Out of 6 IIM libraries 04 (66.67%) libraries conduct ILP and 02 (33.33%) libraries did not respond.

Out of total 13 libraries 09 (69.23%) libraries conduct ILP, 01 (7.70%) library does not conduct ILP and 03 (23.07%) libraries did not respond to the questionnaire.

The data collected from 09 libraries that conduct ILP has been tabulated in the tables given below to assess the status of ILPs in libraries of IITs and IIMs.

Table 2. ILP: Budget Allocation

Budget Allocation for ILP	No. of Libraries
Allocated	01(11.11%)
Not Allocated	08 (88.89%)
Total	09 (100%)

Only 1 (11.11%) library has a separate budget allocation for ILP while 08 (88.89%) libraries do not have a separate budget allocation for ILP.

Table 3. ILP: Mandatory for Students

Information Literacy Programme	No. of Libraries
Mandatory	02 (22.22%)
Not Mandatory	07 (77.78%)
Total	09 (100%)

Table 3 shows that ILP is not mandatory in 07 (77.78%) libraries. Only 02(22.22%) libraries have made ILP mandatory for students.

Table 4. ILP: Integration into Curriculum

Information Literacy Programme	No. of Libraries
Integrated as part of Curriculum	01(11.11%)
Not Integrated as part of Curriculum	08 (88.89%)
Total	09 (100%)

The above table shows that 08(88.89%) libraries have not integrated ILP in the curriculum. Only 01(11.11%) library has integrated ILP in the curriculum.

Table 5. ILP: Assessment of User Needs

User Needs	No. of Libraries
Assessed	05 (55.56%)
Not Assessed	04 (44.44%)
Total	09 (100%)

Table 5 shows that 5(55.56%) libraries assess user requirements before implementation of ILP while 4(44.44%) libraries do not assess user requirements.

Table 6. ILP: Adoption of IL Standards/Models

IL Standards/Models	No. of Libraries
Adopted	Nil
Not Adopted	08 (88.89%)
No Response	01 (11.11%)
Total	09 (100%)

IL Standards and Models are not adopted by 08(88.89%) libraries. One (11.11%) library did not respond to the questionnaire.

Table 7. ILP: Separate Section/Staff

Information Literacy Programme	No. of Libraries
Separate Section/Staff	Nil
No Separate Section/Staff	08 (88.89%)
No Response	01 (11.11%)
Total	09 (100%)

Out of 9 libraries 8 (88.89%) libraries do not have separate section/staff to conduct ILP. while 01(11.11%) library did not respond to the query.

Table 8. Instructors for Information Literacy Programme

Training by	No. of Libraries
Only Library Staff	04 (44.44%)
Both Library Staff and Academic Staff	Nil
Both Library Staff and Staff of e-publishers	05 (55.56%)
Library Staff, Academic and Staff of e-publishers	Nil
Total	09 (100%)

Table 8 shows that ILP is conducted independently by the Library Staff in 4 (44.44%) libraries and in 5(55.56%) libraries

ILP is conducted in collaboration of Library staff and Staff of e-publishers.

Table 9. Customization of ILP

Customization of ILP	No. of Libraries
Same ILP for all users	05 (55.56%)
Customization of ILP according to user	04 (44.44%)
Total	09 (100%)

Table 9 shows that 5(55.56%) libraries have a common ILP for all users and 4 (44.44%) libraries customize ILP according to user.

Table 10. Promotion of ILP

Method Used for Promotion of ILP	No. of Libraries
Circulate information to departments	08 (88.88%)
Post information on notice boards and blogs	06 (66.67%)
Post information on library website	05 (55.56%)
Circulate brochures, pamphlets, etc.	03 (33.34%)
Send individual e-mails to users	06 (66.67%)
Involve faculty members	2 (22.22%)
Send SMS	Nil
No response	1(11.11%)

Table 10 shows that libraries are using both offline methods and online methods to promote ILP being conducted by them though offline methods are still more popular. But SMS service is not being used. Also only 2 libraries (22.22%) involve academic staff for promotion of ILP.

Table 11. Items included in ILP

S.No.	Method	No. of Libraries
1.	Library organizational structure	06 (66.67%)
2.	Library rules and regulations	09 (100%)
3.	Importance of library and role of library staff	07 (77.78%)
4.	Information sources and their peculiarities	09 (100%)
5.	Selection of right information source	05 (55.56%)
6.	Information services provided by the library	09 (100%)
7.	Library classification	06(66.67%)
8.	Use of library catalogue	09 (100%)
9.	Use of other retrieval tools like indexes, bibliographies,etc	08 (88.89%)
10.	Use of path finders	02 (22.22%)
11.	Using computers (practical skills)	02 (22.22%)
12.	Using internet (practical skills)	03 (33.34%)
13.	Media Literacy	03 (33.34%)
14.	Research Literacy	03 (33.34%)
15.	Search strategy	08 (88.89%)
16.	Search engines and search techniques	05 (55.56%)
17.	Using e-documents and databases	09 (100%)
18.	Intellectual Property Right	05 (55.56%)
19.	Numerical and Visual Literacy	01 (11.11%)
20.	Writing references	01 (11.11%)
21.	Communication Literacy	02 (22.22%)
22.	Social Literacy	01(11.11%)
23.	Report writing	01 (11.11%)
24.	Preparing a project using different types of literacy	01 (11.11%)

It is evident from Table 11 that most of the libraries are

providing library orientation through their ILP program. Libraries are also imparting instructions on use of e-databases and search engines. But there is not much emphasis on other aspects of IL such as research literacy, communication literacy, numerical and visual literacy, media literacy, social literacy, IPR, writing references and report writing.

Table 12. ILP: Evaluation after Implementation

Information Literacy	No. of Libraries
Evaluated	03 (33.34%)
Not Evaluated	04 (44.44%)
No Response	02 (22.22%)
Total	09 (100%)

Table 12 shows that ILP is evaluated in only 03 (33.34%) libraries after implementation. Four (44.44%) libraries do not evaluate the ILP and two libraries 02(22.22%) did not respond to the question.

Table 13. ILP: Constraints in Implementation

Constraints	No. of Libraries
Lack of Policy in this regard	02(22.22%)
Lack of Staff	04 (44.44%)
Lack of trained staff for the purpose	03 (33.34%)
Need for ILP not felt by users	01 (11.11%)
Lack of enthusiasm in the staff	02 (22.22%)

It is evident from the above table that out of 9 libraries, 04 (44.44%) libraries feel that Lack of Staff is a major constraint followed by Lack of trained staff for the purpose (03, 33.34%) libraries, Lack of Policy in this regard (02, 22.22%) libraries, Lack of enthusiasm in the Staff (02, 22.22%) and Need for ILP not felt by users (01, 11.11%) library.

Findings

1. Out of total 13 libraries only 09 (69.23%) libraries conduct ILP. (Table 1)
2. Out of 9 libraries, 08 (88.89%) libraries do not have a

- separate budget allocation for ILP. (Table 2)
3. Only 02(22.22%) libraries have made ILP mandatory for students and in only one institution 01 (11.11%) IL has been integrated into the curriculum. (Table 3 and 4)
 4. Five 5(55.56%) libraries assess user requirements before implementation of ILP and only 03 (33.34%) libraries evaluate the program after implementation. (Table 5 and 12)
 5. IL Standards and Models are not adopted by 08(88.89%) libraries. No response from one library. (Table 6)
 6. There is no separate section or staff to conduct ILP in 08 (88.89%) libraries. (Table 7)
 7. ILP is conducted independently by the library staff or in collaboration with the staff of e-publishers. There is no involvement of faculty in this regard. And only two (22.22%) libraries involve faculty for promotion of ILP. (Table 8 and 10)
 8. In 5 (55.56%) libraries ILP is common for all users. (Table 9)
 9. It is evident from Table 11 that most of the libraries are providing library orientation through their ILP program. But there is not much emphasis on other aspects of IL.
 10. Lack of staff (44.44%) and lack of trained staff (33.33%) were found to be major constraints in the implementation of ILP. (Table 13)

Suggestions

1. A policy for IL needs to be framed at national level for higher education for smooth and effective implementation of ILP in higher education institutions. Library and Information Science professionals should take up the cause through professional forums. Emphasis should be laid on following international IL standards/models.
2. It is suggested that librarians should play a proactive

role in promoting IL so that the importance of ILP is realized by the administration, faculty and students. Customized ILP for users including administrative staff will help users understand the importance of library, library staff and IL. This will not only help in formulating a policy for implementation of ILP but also help in allocation of budget for it.

3. Proper implementation of ILP requires separate staff which is trained for the purpose and is able to devote time for designing, implementation and evaluation of ILP and so it is suggested that libraries should take measures in this regard.
4. Faculty members should also be involved in the designing, promotion and implementation of ILP. As faculty members better understand the need of their students it will help in designing a more user-centric and effective ILP. Also it will help in better promotion of ILP among students.
5. With the help of authority and faculty, ILP should be integrated into the curriculum. This will ensure active participation of library staff, faculty and students in ILPs thus meeting the goal of converting students into life-long learners.
6. Information Literacy is an amalgamation of many literacy and so it should not be limited to library literacy or use of e-documents. Especially an undergraduate should be introduced to different types of literacy and taught how to create a research report using the different items taught in the ILP.
7. ILP is usually a one-shot programme conducted at the beginning of the academic session but if it is conducted in a phased out manner it will prove to be more effective.
8. Libraries should emphasize on conducting the ILP using new and interesting techniques like interactive tutorials, webinars, embedded librarianship and gaming.

9. Libraries should lay emphasis on assessment of user needs before implementing ILP and evaluation of the program after implementation. Customization of ILP according to user needs can only ensure its effectiveness.
10. IL should be incorporated into the curriculum to overcome the lack of trained IL instructors.

Conclusion

IL has been recognized as a human right by UNESCO. It is a life skill for survival in today's knowledge society. Hence, it is important for libraries to recognize its importance. We need to create awareness about IL and promote it aggressively among not only students but faculty and administration also. A revamping of our library orientation program to include other relevant aspects according to user needs is imperative. A well designed and effectively delivered ILP will ensure that our users become independent life-long learners and also users of library and this in turn will ensure the sustainability of libraries. ♦

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Virtual Reference Service in Academic Libraries: A Case Study of the College Libraries of Kolhapur City

Balaji A.Kamble
Namita B. Khot

Abstract : The paper explains the term of Virtual Reference Service (VRS) in academic libraries. The survey investigates into the state of Virtual Reference Service in the college libraries of Kolhapur. The study reveals that although a remarkable advancement in the automation and electronic access to information has been achieved in these libraries, there is a long way ahead to march towards the establishment of standard Virtual Reference Service in the Kolhapur city.

Keywords: Virtual Reference Service; Digital Reference Service; Live Reference service

Introduction

Academic libraries are plying a vital role in educational development. Apart from Technology is developing at a very fast rate and what looks a myth a few years back is becoming a reality now. The largest single factor which caused the significant changes in library operations and services in this century is undoubtedly the evolution of information technology. Technology has changed the way the libraries serve their users and this change will continue in future also. While continuing to provide many traditional information services, libraries are developing new skills and taking

new roles that are necessary to support technology based services. In the libraries and information centers "Reference Service" is an important personalised service. Traditionally, it is a one-to-one service with user and reference librarian. The user is helped by the variety of sources available to meet the information needs. But in the present era, the library and information profession is facing the challenges of so called 'electronic age' and being transformed by technology. So the advancement in information technology has brought out incredible changes in almost every aspect of information services. In the Kolhapur City there are 12 academic colleges where the thrust is on imparting education and pursuing research and consultancy. Thus, with the advancement of changing technology the modes of providing reference service in the academic libraries are gradually changing. It is now presented to the user in a new and more developed form that is "virtual reference service", which is otherwise known as "digital reference service".

2. Objectives

- 1) To observe the current demands of library users regarding the information
- 2) To introduce the virtual reference service to library users
- 3) To systematically identify the strength and weakness of existing reference service available in these libraries
- 4) To promote the virtual reference service in regular use

3. Methodology

The success of any social research lies with careful selection of a suitable methodology. For the purpose of the present study, websites of all the academic libraries were explored to identify and assess the present state of virtual reference services provided in the libraries. Questionnaire method is used in this study for data collation and websites of these colleges are also used for observation and update information of these colleges.

4. The Term of Virtual Reference Service in Library

Unlike traditional reference, virtual reference services allow patrons to submit questions and receive answers via the Internet and other electronic means. Linda Berube (2003) defines that Digital reference or virtual reference primarily refers to a network of expertise, intermediation and resources placed at the disposal of someone seeking answers in an online environment. Joann M Wasik (2003) defines "Digital reference and Ask-A services are Internet-based question-and-answer services that connect users with experts in a variety of subject areas. In addition to answering questions, experts may also provide users with referrals to other online and print sources of information".

Thus, the virtual reference service connects the users with librarians or information professionals and help them to receive direct assistance irrespective their location and time. In addition to answering questions, these information experts may also provide users with referrals to other online and print sources of information and support the development of skills such as information literacy. The term, "virtual reference," "digital reference", "e-reference," "Internet information Services," "live reference," and "real-time reference" are used interchangeably to provide of virtual reference service.

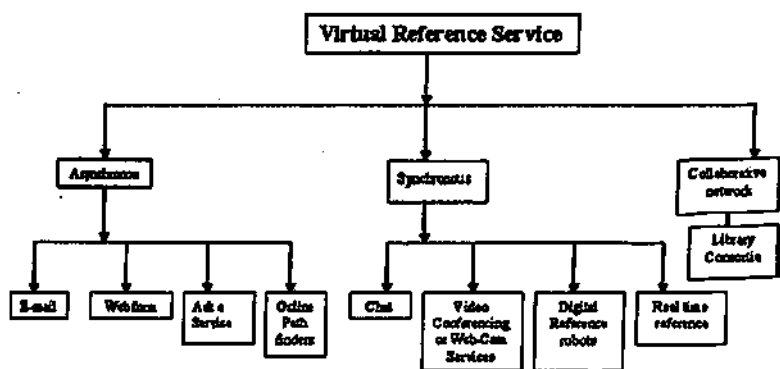


Fig: Topology of virtual Reference Service

The main objectives of virtual reference service in libraries are to provide individual assistance and instruction; to provide and maintain an appropriate collection of reference resources; to help in marketing reference and resources; to serve as a public relations representative and to help in online searching

6. Academic Colleges in Kolhapur: A Profile

Kolhapur is a well developed city in the Maharashtra, was established by great Maratha King Rajrshi Shahu Maharaj. In Kolhapur city there is only a single university i.e. Shivaji University having A grade accredited by NAAC. There are 12 academic colleges affiliated to Shivaji University, 2 nos of colleges are technical and others are traditional. All the colleges have a separate library buildings and accredited by NAAC in time. The college libraries are playing very important role in educational development as well as institutional development. Each of them has a rich collection and used standard software for computerization of library.

Sr.No.	College Name
1)	RajrshiShahu College
2)	Shahaji College
3)	Kamala College
4)	Commerce College
5)	Night College
6)	Vivekanand College
7)	New College
8)	KMC College
9)	Gokhale College
10)	Mahavir College

Table 1: List of College Libraries in Kolhapur City

7. Virtual Reference Service Provided in College Library

This service refers to a network of experts, intermediation and resources placed at the disposal of someone seeking answer online. These services are provided through e-mails, web forms, chat, videoconferencing, digital reference robots and FAQs, etc. Keeping in view the importance of digital resources, these academic libraries are trying to provide better virtual reference service by following manner.

7.1 Reference Desk Service

The reference desk in the libraries provide access to various indices, reviews of the quality, credible and current information-based sites and assists the readers in navigating these sites to satisfy their required need. This facility is not available in all libraries only two libraries having this facility.

7.2 E-mail Reference Service

In e-mail reference service, the user sends the concerned library an e-mail with a reference query to supply whatever information he or she feels is necessary. It can be provided to the users in different forms, such as TOC Alerts, customized news to users, latest additions of library resources and provide answers to the query by different ask a services such as ASK A Librarian and Question point, etc. This service is available in all libraries. Some libraries have their college email and remaining has used librarian's email.

7.3 Real Time Reference

The libraries of Kolhapur are attempting to provide more and more is live reference. These are real time, interactive reference service in which user can talk to a real, live reference librarian at any time day or night, from anywhere in the world. Chat technology enables users to communicate on the internet with others in real time with users through a series of messages sent back.

7.4 Links to E-Resources

These colleges are traditional and the courses are also running in traditional subject. Students are demanding mainly current affairs because all of them are trying to face the competitive examinations. Today the information also publishing in e format. The growing popularity of electronic information resources and the increasing demand of information seekers have necessitated the present day libraries to acquire e-resources. The libraries of Kolhapur have built up a good collection of e-resources such as, e-books, e journals, e-databases, e-thesis, standards, patents etc. and the links to e-resources provide a quick accessibility all these resources. Through the library FAQ, OPAC and Links to other open access/ free resources, the users are capable to search their required information on line and obtain such resources through electronic mode of distribution.

7.5 Feedback form Service

In feedback form, the libraries provide an online form for asking questions to libraries, librarian, also sending suggestion, views and comment upon the library service for building up the service in a more effective way. Now days all the college libraries are trying to provide feedback form service to build up a standard and user oriented library service.

8. Findings

- 1) All libraries having a good collection and providing ICT based services
- 2) E-mail, Facebook, WhatsApp, Blogs and twitters are using by the librarian for communication to users
- 3) E-collection of information is uploaded on their websites
- 4) Websites are the main source of providing the current information of library
- 5) 7 libraries are trying to access 100 percent e resources for providing virtual reference service.

8. Conclusion-

The concept of virtual reference service are being developed

and implemented at libraries. If Virtual Reference Service is to evolve successfully as library and information services, librarians need to engage in ongoing assessment and evaluation of those services. Such assessment is essential for planning and development of these services, for cost and financial decision-making and perhaps most importantly, to ensure that user information needs are met. This study is an important first step towards better understanding how digital library services can be successfully integrated into existing library and information services of the College Libraries of Kolhapur City. ♦

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Awareness and Use of Electronic Information Resources (EIR) among the Research Scholars of Tezpur University: a Survey

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Abstract: The present study deals with the awareness and use of electronic information resources (EIR) by the research scholars of Tezpur University. The study revolves around issues like awareness of users about the available electronic information resources, their preference of electronic information resources, hindrance faced by the users (research scholars) in using these resources, their level of satisfaction with these resources, etc. Moreover suggestions of users to increase the accessibility and utility of electronic information resources have also been derived. It has been found that users are not sufficiently aware about the resources of institutional repository. E-journals emerged to be the most popular and widely used electronic information resource. Further, lack of sufficient guidance in using electronic information resources was termed as the prime hindrance in using these resources.

Keywords: Electronic Information Resources (EIR)s; User Awareness; E- journals; E-books; E-theses; Institutional repository; Online Databases.

Introduction

In the current technology driven environment, electronic information resources (EIR) play an important role in academic and research activities and therefore academic library more particularly university libraries invests huge amount of money every year on subscription of electronic information resources to serve its users. Electronic information resources is a broad term which can be anything that has identity of its own such as electronic journals (e-journals), electronic books (e-books), electronic theses and dissertations (e-theses and e-dissertations), electronic catalogue (e-catalogue such as OPAC/WEBOPAC), electronic databases (e-databases), e-lectures, e-presentations etc. Over the last few years' popularity of electronic information resources have been increasing because of its multidimensional features and these are becoming a major portion of library collections and the choice of academic and public library users. Thus electronic information resources have become the most important source of information which provides access to limitless knowledge to the research scholars and all academicians.

2. Literature Review:

Akpojotor, Lucky O (2016) investigated the awareness and usage of electronic information resources among postgraduate students of library and information science in Southern Nigeria. The results obtained revealed that postgraduate students of library and information science are quite aware and they prefer to use (highly Use) electronic information resources. Finding also revealed that postgraduate LIS students are very much familiar in the use of electronic information resources. Author finally concluded that electronic information resources are essential tools for empowering postgraduate students of library and information science in Southern Nigeria. Owolabi, Sola and [et.. al..] (2016) studied utilization of electronic information resources by undergraduates in the Faculties of Education and the Social Sciences in University of Ibadan. Authors found that the internet

services, e-mail services, online databases, electronic databases and cybercafés were the available electronic information resources often used by the undergraduate students in University of Ibadan. Finding revealed that inadequate power supply, poor network/ internet connectivity and limited access to computer terminals were some constrain that undergraduate faced while utilizing electronic information resources. Padma. P [et...al]..2014) attempted to trace out the awareness and use of electronic information resources(EIR) by the engineering students of two engineering colleges viz. Pannai College of Engineering and Technology and Pandian Saraswathi Yadav Engineering college located in Sivagangai District. Findings revealed that most of the student were aware the electronic resources and access the electronic resources. E-journals are the most preferred electronic information resources and respondents access the electronic resources regularly and students were very much satisfied with these resources. Lack of facilities is the prime problem while using electronic resources. Ahmad Moin and Panda, K. C.(2013) investigated awareness and use of library databases and other electronic information resources among the faculties within and outside the libraries. The results revealed that majority of the faculty members were aware and use the electronic information resources and viewed that e resources are very useful and important to their work. Malarvizhi S. Rosy and Sarangapani, R (2016) investigated the usage and satisfaction level among the faculty members with the electronic information resources and the problems faced by faculty while using the electronic resources and services by the faculty members of Karunya University, Coimbatore. Bankole, Olubanke Mofoluwaso and others(2015) investigated the usage of electronic information resources by undergraduates of Federal University of Agriculture, Abeokuta, Nigeria. The findings revealed that 92.4% of the respondents used electronic information resources and they use it for completing class assignments, to obtain course related materials and to keep abreast of latest development in their field. Finding revealed that

students were satisfied with the library electronic resources. Insufficient skills, difficulty in finding relevant information and frequent power outage were the main constrain that students faced while using electronic information resources. Authors suggested training to students to develop information search skill by the library; the provision of networked computers in departments and colleges would increase the use of electronic information resources among undergraduates. Firdaus, S and Haridasan, S (2015) examined the awareness and use of web resources among the engineering students of Zakir Hussain College of Engineering and Technology (ZHCET) and Aligarh Muslim University (A.M.U), Aligarh. Findings revealed that almost all the engineering students of Zakir Hussain College of Engineering and Technology (ZHCET) were aware about web resources among. Findings revealed that students were highly satisfied with the use of web resources and viewed that the web resources have made it easier to find the needed material and also agreed that web resources have had a significant impact on their academic tasks. . Kalbande, D.T and Chavan S P(2015) investigated in their paper the role of digital library resources, and its impact on academic communities in fulfillment of their information needs. Khan,M. A and Khanam,Z(2014) investigated use and users satisfaction on web resources and services and obstacles which they faced (come) during the use of web-resources and services by social science and arts faculty members, A.M.U. Aligarh. Findings revealed that social science and arts faculty members were(are) aware of modern web services like email, chat, blogs, list serves, newsgroups and they frequently using it for their study teaching and research purposes. Social science and arts faculty members, A.M.U. Aligarh viewed that web resources improves research work by providing relevant and required information. Too much information retrieved, limited access to computers and lack of IT knowledge to effectively utilize the web resources were the problems faced while accessing web resources and services. P. Das et al., (2013) attempted to study the awareness, use and the problems

encountered by science research scholars of Berhampur University, Berhampur, Odisha while using electronic information resources. Finding revealed that the science research scholars were (are) aware of the electronic information resources (EIR) and suggested for the improvement in the access facilities more (and most) particularly increases the web resources to support their research activities. Brar, K. S (2012) investigated the awareness and use of e-journals by researchers. The study revealed the purpose of using e-journals, frequency of use, location of accessing e-journals, using patron and satisfaction level of users. Kiran Kumar, G.K and Kumbar, M (2012) studied the use of electronic resources among the faculty in five autonomous Engineering Colleges in Bengaluru. Authors investigated different aspects relating to the use of electronic resources such as purpose, benefits, preference of web browsers, search engines, file formats, problem faced, and search patterns. Findings revealed that the faculties were well aware and they used electronic resources in their academic and research needs.

3. Objective of the Study:

- To study the user awareness about electronic information resources (EIR).
- To find out the purpose of using electronic information resources (EIR).
- To investigate the frequency of using electronic information resources (EIR).
- To investigate the types of electronic information resources (EIR) users prefer
- To find out the problems being faced by the research scholars while using the electronic information resources (EIR).
- To study the satisfaction level of users.
- To derive opinion & suggestions from users for improving accessibility of electronic information resources (EIR).

4. Methodology

Questionnaire based survey method was used for the current study. Keeping in view the objectives of the study, a structured questionnaire was designed and distributed among the research scholars to collect relevant data. Library users were also interviewed and statistical methods were applied to analyse the collected data.

5. Limitation

At present, there are 334 registered research scholars in Tezpur University carrying out research under different programme. In order to make the study more specific and meaningful this survey was conducted only among the research scholars instead of covering each category of registered users.

6. Tezpur University

Tezpur University was established by an Act of Parliament in 1994. Central Library has been functioning since 1994. At present, the library holds about 77,286+ books and 7848 back volumes (of electronic information resources). Apart from the online electronic information resources and database provided by e-ShodhSindhu Consortium and DeLCON Consortium, the library also holds more than 2286 CDs scattering to different thought contents. Library users can access book database, these database, journal database, e-journals and other electronic information resources (EIR) from any terminal within the University campus

7. Analysis of Data

Table I: Types of Electronic Information Resources (EIR) available in Central Library, Tezpur University

Sl. No	Availability of Electronic Information Resources(EIR) in Central Library, Tezpur University	
1	E-Book	500
2	E-journals	11958
3	Online databases	44 .

4	Library Consortia	e-ShodhSindhu Consortium
5	Delcon DBT-e-library consortium	
6	Institutional Repository	996
7	CD-ROM	2286

Table I indicates the available electronic information resources (EIR) in Central Library, Tezpur University for the existing members of the university.

Table II: Percentage of Questionnaire Responded

Sl. No	Respondents	Questionnaire distributed	Questionnaire Responded	Age %
1	Research Scholars	120	89	74.17

To collect relevant data total 120 questionnaires were prepared and served among the research scholars of Tezpur University. Out of 120 questionnaires 74.17% (89) respondents of targeted population responded to our questionnaire.

Table III: Gender wise Distribution of respondents

Sl.No.	Gender	Respondents	Age
1	Male	38	42.70
2	Female	51	57.30
	Total	89	100

Table III shows gender wise distribution of respondents. Out of 89 respondents 42.70% (38) were male and 57.30 % (51) were female research scholars.

Table IV: Awareness about different types of EIR

Sl.No	Types of EIRs	Yes	No	Total (%)
1	E-Books	89(100%)	0	89(100%)
2	E-Journals	89(100%)	0	89(100%)
3	Online Databases	89(100%)	0	89(100%)
4	Institutional Repository	68(76.40%)	21(23.60%)	89(100%)
5	E-Thesis/Dissertations	89(100%)	0	89(100%)
6	CD-ROM	55(61.80%)	34(38.20%)	89(100%)

Table IV depicts the awareness among the research scholars about the electronic information resources (EIR) available at Tezpur University. Findings reveal that except institutional repository, and CD-ROM databases almost all the research scholars are well aware of the electronic information resources (EIR) available in the library. Findings reveals that 23.60 %(21) and 38.20 %(34) respondents were not aware about the Institutional Repository and CD-ROM databases respectively.

Table V: Frequency of using EIR

Sl. No	Types of EIRs	Daily (%)	2-3 times in a Week (%)	Once in a week (%)	Occasionally (%)	Total (%)
1	E-Books	52(58.43%)	37(41.57%)	0	0	89(100%)
2	E-Journals	58(65.17%)	31(34.83%)	0	0	89(100%)
3	Online Databases	56(62.92%)	33(37.08%)	0	0	89(100%)
4	Institutional Repository	19(21.35%)	26(29.21%)	32(35.96%)	12(13.48%)	89(100%)
5	E-Thesis/Dissertation	6(6.74%)	19(21.35%)	53(59.55%)	11(12.36%)	89(100%)
6	CD-ROM	22(24.72%)	21(23.60%)	9(10.11%)	37(41.57%)	89(100%)

Table V reveals that almost all the research scholars use all the electronic information resources (EIR) available in the library.

Among the available electronic information resources (EIR) 65.17 % (58) and 62.92 % (56) respondents have the habit of using e-journals and online databases every day, followed by e-book with 58.43 % (52) respondents. 41.57% (37) respondents access e-books 2-3 times in a week followed by online databases and e-journals with 37.08% (33) and 34.83% (31) respondents. 59.55 % (53) respondents use e-thesis and dissertation once in a week and very few portion 41.57 % (37) respondents mentioned that they use CD-ROM occasionally.

Table VI: Purpose of using EIR

Sl. No	Purpose of using (EIR)	Yes	P/C (%)	No	P/C (%)	Total (100%)
1	For research work	77	86.52	12	13.48	89(100%)
2	For writing research articles	59	66.29	30	33.71	89(100%)
3	For finding relevant information in the area of specialization	69	77.53	20	22.47	89(100%)
4	To keep up to date subject knowledge	53	59.55	36	40.45	89(100%)

Table VI reveals that 86.52% (77) respondents use the electronic information resources (EIR) for the purpose of research work. 77.53% (69) research scholars use electronic information resources (EIR) to locate relevant information in their area of specialization. 66.29% (59) research scholars use electronic information resources for writing research articles and very few 59.55% (53) research scholars use electronic information resources to keep up to date subject knowledge.

Table VII: Types of Electronic Information Resources (EIR) that Research Scholars Prefer to Use

Sl No	Types of EIRs	Daily (%)	2-3 times in a Week (%)	Once in a week (%)	Occasionally (%)	Total (%)
1	E-Books	27(30.34%)	41(46.07%)	15(16.85%)	6(6.74%)	89(100%)
2	E-Journals	71(79.78%)	11(12.36%)	7(7.86%)	0	89(100%)
3	Online Databases	56(62.92%)	21(23.6%)	8(8.99%)	4(4.49%)	89(100%)
4	Institutional Repository	9(10.11%)	21(23.6%)	23(25.84%)	36(40.45%)	89(100%)
5	E-Thesis/Dissertations	12(13.48%)	27(30.34%)	33(37.08%)	17(19.1%)	89(100%)
6	CD-Rom	11(12.36%)	19(21.35%)	21(23.6%)	38(42.69%)	89(100%)

The Table VII shows the different types of electronic information resources (EIR) used by the research scholars of Tezpur University. It is observed that e-journals are very popular among the research scholars .79.78 %(71) respondents use e-journals regularly, followed by online databases with 62.92%(56) respondents.46.07%(41)) respondents use e-book 2-3 times in a week and 37.08%(33) respondents use e-thesis and dissertation once in a week. It observed in the table that the use of the CD ROM and the content of the institutional repositories are very negligible 40.45%(36) and 42.69%(38)respondents use institutional repositories and CD-ROM databases occasionally.

Table VIII: Reasons for using EIR:

Sl.No	Reasons for using EIR	Agreed (%)	Disagreed (%)	Not Sure (%)	Total (%)
1	Easy to search.	83(93.26%)	6(6.74%)	0	89(100%)
2	Improved the quality of work	62(69.67%)	23(25.84%)	4(4.49%)	89(100%)
3	Reduced the amount of searching for print information sources in libraries	74(83.14%)	13(14.61%)	2(2.25%)	89(100%)
4	Varieties of information	55(61.80%)	31(34.83%)	3(3.37%)	89(100%)
5	Up-to-date information	69(77.52%)	13(14.61%)	7(7.87%)	89(100%)
6	Remote Access	81(91.01%)	8(8.99%)	0	89(100%)

Table VIII depicts the reasons for using electronic information resources (EIR) available at Central library, Tezpur University. Findings reveal that the research scholars prefer to use EIR because these resources are easy to use and can be accessed at any time and without visiting the library. Findings revealed that 93.26%(83) and 91.01%(81) respondents respectively prefer to use electronic information resources(EIR) because these resources are easy to access and can be accessed from any location and at any time without visiting library.83.14%(74) respondents use electronic information resources (EIR) because it reduced the amount of searching for print information sources in libraries.69.67%(62) and 77.52%(69) use electronic information resources (EIR) because these resources contains up-to-date information and hence it improved the quality of their work.

Table IX: Satisfaction Level of Research Scholars on Subscription of EIR

Sl.No	Types of electronic information resources (EIR)	Highly Satisfied (%)	Satisfied (%)	Not Satisfied (%)	No Response (%)	Total(%)
1	E-Book	11(12.35%)	35(39.33%)	41(46.07%)	2(2.25%)	89(100%)
2	E-journals	47(52.81%)	29(32.58%)	13(14.61%)	0	89(100%)
3	E-dissertation/thesis	44(49.44%)	23(25.84%)	17(19.1%)	5(5.62%)	89(100%)
4	Electronic/online databases	45(50.56%)	29(32.58%)	11(12.36%)	4(4.5%)	89(100%)
5	Resources in institutional repository	19(21.35%)	5(5.62%)	65(73.03%)	0	89(100%)
6	CD/ROM	9(10.11%)	49(55.05%)	27(30.34%)	4(4.5%)	89(100%)

Table IX reveals that research scholars were highly satisfied with the collection of e-journals, online databases and with the collection of e-thesis and dissertations. 52.81% (47) respondents

are highly satisfied with the collection of e-journals, followed by collection of electronic/online databases and e-thesis and dissertation with 50.56% (45) and 49.44% (44) respondents respectively. 55.05% (49) respondents were satisfied with the collection of CD-ROM. 46.07% (41) and 73.03% (65) respondents were not satisfied with the collection of e-books and with the resources contained in the institutional repository.

Table X: Constraints in the Use of EIR

Sl.No	Problems	Agreed(%)	Disagreed(%)	Not Sure(%)	Total(%)
1	Lack of awareness	29(32.58%)	49(55.06%)	11(12.36%)	89(100%)
2	Lack of guidance and training	77(86.52%)	12(13.48%)	0	89(100%)
3	Lack of electronic information resources in the field of specialization	69(77.53%)	17(19.1%)	3(3.37%)	89(100%)
4	Poor network connectivity	71(79.77%)	13(14.61%)	5(5.62%)	89(100%)
5	Inadequate number of computers in the library	49(55.06%)	29(32.58%)	11(12.36%)	89(100%)

Table: X reveals that 86.52 % (77) respondents found it difficult to use electronic information resources (EIR) available in the library due to the lack of guidance and training. 79.77% (71) respondents found it difficult to access electronic information resources due to poor network connectivity. 77.53%(69) research scholars faced difficulties due to the lack of relevant electronic information resources in their field of specialization and 55.06%(49) respondents expressed inadequate number of computers in the library as a hindrance to access electronic information resources (EIR).in the library and 32.58%(29) respondents viewed that the lack of awareness about the available electronic information resources (EIR) was a constraint in the use of these resources (EIR).

Table XI: Users Opinion Towards Improving Accessibility of EIR

	Users opinions & suggestions	Agreed (%)	Disagreed (%)	Not Sure (%)	Total (%)
1	Conducting regular guidance and training programme among the users to enhance their skills to utilise EIR effectively	77(86.52%)	12(13.48%)	0	89(100%)
2	Create awareness about the available EIR by conducting orientation programme at the beginning of each academic session or through displaying EIR in the library web page	32(35.96%)	46(51.68%)	11(12.36%)	89(100%)
3	Installation of more terminals in the library to access the EIR effectively	68(76.4%)	21(23.6%)	0	89(100%)
4	Improvement of Internet speed	66(74.16%)	18(20.22%)	5(5.62%)	89(100%)
5	Subscribe more electronic information resources	70(78.65%)	17(19.1%)	2(2.25%)	89(100%)

Table XI reveals the opinions of the users towards improving accessibility of electronic information resources (EIR). Findings shows that 86.52%(77) respondents are in favour of conducting regular guidance and training programme among the users to enhance their skill to utilize electronic information resources (EIR) effectively. 78.65% (70) respondents proposed to subscribe more EIRs on different fields. 76.4%(68) respondents are in favour of installations of more computers in the library and 74.16%(66) respondents are in favour of improvement of internet speed so that resources available in the web can be easily downloaded. 35.96%(32) respondents suggested to create awareness about the available EIR by conducting orientation programme at the beginning of each academic session.

8. Findings

The findings of the survey are as follows:

8.1) It has been found that apart from institutional repository and CD ROM, users were well aware of the other electronic resources like e-books, e-journals, e-thesis, online databases, etc. 23.60%

users were not aware of institutional repository and 38.20% users were not aware of CD ROM.

8.2) 65.17% users use e-journals daily and 62.92% users use online databases daily. Further 58.43% users use e-books daily. 59.55% users use e-thesis/ dissertation only once in a week and 35.96% users use institutional repository only once a week. 41.57% users use CD ROM occasionally only.

8.3) It is also revealed that 86.52% users use electronic information resources (EIR) for their research work while 66.29% users use these resources for writing research article. On the other hand 77.53% users use EIRs to acquire relevant information about their area of specialization and 59.55% users use these resources to keep themselves up to date with their subject knowledge.

8.4) E-journals emerged to be the most preferred EIR among the research scholars followed by e-books. This can be derived from the fact that 79.78% users use e-journals daily while 62.92% users use e-books on a daily basis. On the other hand institutional repository and CD ROM are the less used EIRs.

8.5) Easy to search and remote access were the prime advantages of using EIRs. Findings reveals that 93.26% and 91.01% respondents respectively prefer to use electronic information resources (EIR) because these resources are easy to access and can be accessed from any location and at any time without visiting library

8.6) Majority of the users 52.81 % are highly satisfied with the e-journals which are subscribed by the library. On the other hand users 73.03 % are not satisfied with the available collection of resources in the institutional repository.

8.7) Lack of guidance and training in using EIRs emerged to be the most pronounced problem among most of the users 86.52 % and another major problem in using EIRs is poor network connectivity as revealed by 79.77 % users.

9. Suggestions

On the basis of the study, following suggestions may be proposed to increase the utility of electronic information resources

9.1) The user education programme should be designed by giving due emphasis on the use of electronic information resources (EIR).

9.2) The users should be explained about the objectives of the current awareness service (CAS) provided by the library and they should be encouraged to keep themselves up-to-date about the available EIRs in the library by using the CAS service.

9.3) Steps should be taken to increase the utility of institutional repository and CD-ROM.

9.4) The staff should be properly trained about the use of EIRs so that in turn they can help the users as and when required.

10. Conclusion

Today electronic information resources have become indispensable for acquiring knowledge for all categories of information seekers and is playing an important role more particularly among the researchers to carry out meaningful study and research in almost all disciplines. Electronic information resources have rapidly changed the way of seeking information and has given a new outlook to the library resources and services. Today fulfillment of the objectives of a library is much dependent on the extent to which its users are satisfied with the available electronic information resources along with the print resources. It is hoped that the study will help to bridge the gap between the available electronic information resources and their utility.

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