Institutional Repositories in India

N. Ashok Kumar
Assistant Librarian
Tamil Nadu Physical Education and Sports University, Chennai – 600 006.

Abstract

Institutional Repository (IR) disseminates rich source of digitized materials drafted and published by learned societies. In India major R& D institutes and few Academic Institutes provide an Institutional Repository (IR) service to its clientele. This IR technology offers the Nobel laureates and researchers to deposit their work, which facilitates the target audience to access the research publications via digital form. This paper discusses about the IR technology implementation in Indian institutes, and also describes its objectives, software usages, growth and development of institutional repositories in India. It is stated that most of the institutes adopt the open source IR software's for creating/developing their own repositories. It is found that major documents deposited in Institutional Repository are theses, dissertations, conference papers, journal articles, reports, patents, etc. This paper also discus about the movement and institutional repositories future in India. This study clearly states that the institutional repository is a very powerful idea that can serve as an engine for institutions of higher education, and more broadly for the scholarly enterprises that supports research activities.

INTRODUCTION:

The closed access system to most of the scholarly literature both published and unpublished paved the way for institutional repositories. The essence of IR is to make research and development publications to be freely available on the internet. This initiative was directed to have an increased visibility of the research outcomes; further this will generate good deal of enthusiasm in advanced studies. Thus the Institutional Repositories were experimented by the Indian educational institutions and R & D institutes to disseminate their scholarly articles. In India there are number of reputed R & D institutes, which produce scholarly rich research documents every year, now adopt this IR service in their homepage. With the mandate to bring together and preserve the intellectual properties of individual departments many institutes came forward to experiment this new service. Some of these institutions provide access to their research documents and learning materials initially to the Indian scholars in other institutions as well as to external scholars in institutions across the globe. The sharing of knowledge may lead to further development in the same discipline or related disciplines. Institutional repository is now becoming a platform for the sharing of knowledge.

DEFINITION:

Before knowing Institutional Repositories, it would be appropriate to know first about the repository. As per wikipedia "A repository is a central place where data is stored and mined. A repository can be a where multiple databases or files are located for distribution over a network or a repository can be a location that is directly accessible to the user without having to travel across a network" ***en.wikipadia.org/wiki/repository***

An institutional repository is a web-based database of scholarly material. It could be cumulative and perpetual (a collection of record). It must be open and interoperable (using OAI-complaint software). The institutional repositories collects, stores, disseminates digital resources and also preserves digital materials for long term usage.

An institutional repository is a set of services that an institute/university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. An effective institutional repository necessarily requires collaboration among librarian, information technologists, archives and record managers faculty and administration and policy makers.

ELEMENTS OF INSTITUTIONAL REPOSITORY:

As the digital Institutional Repository can be any collection of digital material hosted, owned or controlled and disseminate by any institution irrespective of purpose of origin. Institutional Repository can assume many forms and serve a variety of purposes as per the functions and objectives of parent institution. A digital archive of the intellectual product by the faculty, research staff and students/ research scholar of an institution and it should be accessible to end user without boundaries (with in and out of the institution).

The content of an Institutional Repository could be:

- Pre-prints of articles or research reports submitted for Publication
- The text of journal articles accepted for publication
- Revised texts of published work with comments from academic readers
- Conference papers
- Teaching materials
- Student projects
- Doctoral theses and dissertations
- Datasets resulting from research projects
- Committee papers
- Computer software
- Works of art
- Photographs and video recordings

An institutional repository may contain work of which copyright is owned by the author or institute, or for which permission has been obtained to include a copy of the work in the repository.

OBJECTIVES:

The four main objectives for having an academic institutional repository are:

1. To create global visibility for an institution's scholarship;
2. To collect content in a single location;
3. To provide open access to institutional research output by self-archiving;
4. To store and preserve other institutional digital assets, including unpublished or otherwise easily lost ("grey") literature (e.g., theses or technical reports).

METHODOLOGY:

The IR's owned by R & D institutes / Academic institutes in India have been selected from the secondary sources, metadata harvesting services, directories etc for this study. The data related to the R & D institutional repositories have been collected from their respective institutions' websites and other secondary sources. Case study method is also followed for this study. The data's are analyzed based on certain parameters, such as number of documents, software used, growth of collection etc.

INSTITUTIONAL REPOSITORIES AND LIBRARIES IN INDIA:

India has adopted the Open Access model much ahead than other developing countries A number of Indian scientific research institutions, universities and corporate R&Ds produce high quality research accompanied by innumerable scholarly communications published by national and international journals and conference proceedings. A good number of high quality, peer-reviewed open access journals are being published by Indian scholars covering a wide spectrum of subjects.

Some of the leading institutions in India designed their own Institutional Repositories which is listed in the Table-1. From Table-1 it is inferred that most of the institutions developed their own institutional repositories with value added services based on, a) determine goals / business targets of the institute / organization, b) information needs and accordingly develop products, services and capabilities with these in mind. It is evident from the Table-1, that institutes established for specific subject prefer to offer IR service as a mandatory one. And most of the IR's are developed using open source software's. This table also states that documents such as conference papers and thesis are the preferred documents included in the IR.

Table – 1

Institutional Repositories designed in Indian Institutes

S No	Institution	Place	Types of documents	No of items	Software used
1	Bangalore Management Academy	Bangalore	NA	NA	DSpace
2	Delhi College of Engineering,	Delhi	Publications; unpublished ; learning objects (Science General; Technology General)	326	Dspace
3	Documentation Research Training Centre (DRTC)	Bangalore	Publications; Conferences; Theses; Multimedia	372	Dspace
4	ETD of Indian Institute of Science	Bangalore	Theses (Multidisciplinary)	282	Dspace
5	Guru Gobind Singh Indraprastha University	New Delhi	NA	NA	
6	ICFAI Business School	Hyderabad	Published; Conference Papers, Cases Studies (Mathematics; business and economics, LIS; management)	197	DSpace
7	IIM Kozhikode	Kozhikode	Multidisciplinary		GNU-EPrimts
8	Indian Institute of Astrophysics	Bangalore	Theses; Publications; Multimedia Objects (Physics & Astronomy)	1852	Dspace
9	Indian Institute of Management	Kozhikode	Publications; Conferences; Theses; Unpublished (Business & Economics)	411	DSPace
10	Indian Institute of Technology	Delhi	Post-prints; Theses (Multidisciplinary)	2141	Dspace
11	Indian Institute of Technology	Bombay	Theses and Dissertations	3000	Greenstone
12	Indian National Science Academy (INSA)	Bangalore	Conference Papers, Articles, Reports, etc.	818	DSpace
13	Indian Statistical Institute, Library	Bangalore	Publications (Mathematics & Statistics)	191	Dspace
14	Indira Gandhi National Open University (IGNOU)	New Delhi	Learning Objects (Multidisciplinary)	4699	Dspace
15	Information And Library Network Centre (INFLIBNET)	Ahmedabad	Publications; Conferences; Theses Unpublished learning objects; multimedia; patents (Multidisciplinary)	428	Dspace
16	Institute of Petroleum Management	Gandhinagar	NA	NA	DSpace
17	M. N. Dastur & Company (P) Ltd,	Kolk.ata	NA	NA	DSpace
18	Management Development Institute	Gurgaon	Postprints; Conferences; Books; Special	225	Dspacwe

S No	Institution	Place	Types of documents	No of items	Software used
19	National Aerospace Laboratories		Publications; Conferences; Theses ;Unpublished Learning Objects; Multimedia; Patents (Mathematics & Statistics; Technology General; Mechanical Engineering and Materials)	2520	GNU-Eprints
20	National Centre for Catalysis Research	Chennai	Publications; Conferences; Theses (Chemistry & Chemical Technology)	1061	GNU-Eprints
21	National centre for radio astrophysics		Publications; Theses; Unpublished; Learning Objects; Multimedia (Physics and Astronomy)	243	DSpace
22	National Chemical Laboratory	Pune	Theses, Unpublished, Patents (Chemistry & Chemical Technology)	407	Dspace
23	National Informatics Centre(NIC)	New Delhi	Publication (Medical and Allied Sciences)	4141	EPrints
24	National Institute of Oceanography (NIO)	Goa	Publications; Conferences; Theses(Science general; Arts & Humanities; Technology General)	637	Dspace
25	National Institute of Technology	Rourkela	Publications; Preprints; Conferences (Chemistry, Chemical Technology, Mechanical engineering, Materials, Physics & Astronomy)	541	Dspace
26	One world south asia		Publications; conferences; Theses; Unpublished: Books, Patents (Computer and IT; Library & Information Science)	116	GNU-Eprints
27	Raman Research Institute	Bangalore	Postprints; Unpublished; Learning Objects (Physics & Astronomy)	225	Dspace
28	Sarai Multimedia Digital Archive	Delhi	NA	NA	DSpace
29	Sri Venkateswara University	Tirupati	Post prints & Unpublished	1086	Dspace
30	Thapar University	Patiala	Postprints; Conference; Theses; (Multidisciplinary)	382	Dspace
31	Vidyanidhi Digital Library & amp University of Mysore	Mysore	Theses	4858	Dspace

India has adopted the Open Access much ahead of other developing countries In India a number of scientific research institutions, universities and corporate R & Ds produce high quality research accompanied by innumerable scholarly communications published by national and international journals and conference proceedings. More than 31 academic and research institutions have set up their Institutional Repositories as indicated by ROAR (Registry of Open Access Repositories) viz., IISc, IIMK, ISI, NCL, NIO, RRU, NAL, NIT and so on.

There are three kinds of repositories developed in India:

1. Designed for specific in-house scholars
2. Designed for specific subjects
3. Designed for specific documents

1. Designed for specific in-house scholars:

These institutions have established open access institutional repositories (IRs) that disseminate research outputs of respective institution. Sometimes, these are self-archived. Otherwise, administrator of the repositories collects the research documents from different sources and submits the documents to the IR on behalf of the persons concerned

2. Designed for specific subjects:

Few Institutions repositories in India are designed to store and provide access to specific subject collections of documents. The reason behind organising such a open repositories is that scholars with ample of scholarly output but not affiliated to any specific institutes providing the IR facility can host their research articles which belongs to the respective subject field of interest. For example LDL Librarians Digital library developed by DRTC Documentaion Research and Training Centre, Bangalore is a subject-specific repository for the library and information professionals. Another subject-specific repository designed in India is openmed@NIC, maintained by National Informatics Centre, New Delhi. OpenMed@NIC stores and provides access to biomedical literature.

3. Designed for Specific Document:

This IR is designed to store and provide access to documents pertained to specific type of collections. Vidyanidhi of University of Mysore is an example of document type specific collection that stores and provides access to theses and dissertations. Vidyanidhi accepts any thesis or dissertation from any researcher or student that is accepted in any of the Indian universities or institutions.

Digital Repository Software's:

IBM issued Digital Library Software in 1991 to manage collection of digital files. IBM groundbreaking technology grappled with key issue of storage, maintenance, retrieval and display digital content. This was the first effort towards the digital repository software and it showed path to others. There are number of software's available for creating/developing institutional digitals repositories; the brief of the some IR's are given below;

Open Source Digital Repository Software's:

DSpace (http://www.dspace.org) was developed jointly by the MIT library and HP. DSpace modestly describes itself as a ground breaking digital repository system. It captures, stores, indexes, preserves and redistributes an organizations research material formats. DSpace support institutional repositories and electronic records management. DSpace is being used worldwide to meet many digital archiving needs.

EPrints (http://www.eprints.org) is the original digital repository software developed by the University of Southampton to manage an open archive. EPrints was the Open Archives Initiative (OAI) –Complaint repository software. It typically supports collections of pre-prints and technical reports often subject based in scope. Recently this software is being used / implemented to manage multidisciplinary institutional archives.

Fedora (Flexible Extensible Digital Object and Repository Architecture www.fedora.info) is a digital repository system developed jointly by Cornell University Information Science and University of Virginia Library as project. The Fedora projects goal is to provide open-source repository software and related services to serve as the foundation for many different types of Information Management system. Fedora is not a complete system such as DSpace and EPrints whereas it provides an infrastructure upon which services can be developed. It also promotes the buildings of customs tools to expose the repository in creative ways.

Greenstone (http://www.greenstone.org) is software for building and distributing digital library collections. This software is produced by the New Zealand Digital Library Project at University of Waikato and developed and distributed in cooperation with UNESCO and the Human Info: An NGO. It has been issued as Open-Source, multilingual software under the GNU General Public License. Greenstones not only serve and harvest documents and collections over OAI-PMH but collections can be exported to or imported from METS (Metadata Encoding and Transmission Standards).

Commercial Digital Repository Software's:

Apart from the above Open Source Software, some commercially developed softwares also available for digital repository. The name of few is mentioned herein below;

CONTENTdm®- Developed at the University of Washington and distributed by OCLC. The software has tools for acquiring or creating collections; tools for storage of the content and a set of tools for display and retrieval of objects.

Digi Tool- This is a 'enterprise solution for the management of digital assets in Libraries and academic environment.

EN Compass-It is a one module of EN Compass or suite of software for managing and accessing digital content. EN Compass has many modules for various purposes.

Hyperion-It provides organisation, storage and access to digital files by searching both associated Meta data and full text of text files.

Meta Source-Meta source is a suite of tolls used to manage digital collections, including, digital object storage, crawling external collections and support for Metadata schemes.

VITAL-VITAL is a institutional repository software developed by VTLS. VITAL is a set of workflow extensions, management utilities and enhanced searching capabilities build on Fedora Repository Architecture.

Table-2
Open Source Software's Installed in India

S No.	Open source Software	No of Installations	Percentage
1	Dspace	25	80.64%
2	GNU Eprints	5	16.13%
3	Greensotne	1	3.23%
	Total	31	100%

It is evident from the table-2 that the Institutional Repositories in India are rapidly growing with the help of open source software like DSpace, GNU EPrints, Greenstone Digital Library Software, etc,. 80% of the institutions prefer to use DSpace, 16% GNU Eprints and 3% of the institutes use Greenstone open source software. Since information professionals organize the documents of specific interest, these open softwares helps to organize documents, with international metadata standards. Metadata helps in representing a document and later on retrieve a document from the database. In India Institutional Repositories mostly provide an interface of navigate the collection by title, author, subject and document-wise.

The success of institutional repositories has been somewhat spotty. In a 2007-2008 survey, 58% of R&D institutes, 29% of Academic Institutes and 13% of corporate sectors had operational IRs. Now most of the universities and colleges were planning to participate in a consortial IR system. DSpace was the dominant content management package identified in this study. The reported sizes of these IRs ranged from hundreds of thousands of documents. The formats of materials stored in these repositories was diverse, including e-prints, electronic theses and dissertations, digitized special collections, multi-media, course materials, and datasets. Participation from an institution's faculty was, in all cases, a voluntary prospect and generally perceived to be very low.

Table- 3
Percentage analysis of Institutes in India

S. No.	Type of institute	2008	
		No of IR's	**Percentage %**
1	R & D	18	58%
2	Academic	9	29%
3	Corporate	4	13%
	Total	31	100%

OPEN ACCESS MOVEMENTS & IR's FUTURE IN INDIA:

The Central and the State Government are very keen in proliferating more number of Universities and R&D institutes in India. So institutes which involve in research may require their own Institutional Repository (IR). If a National movement is initiated at this juncture to create awareness and the importance to design their own Institutional Repository, the research trend may be enhanced. Since the implementation process doesn't require huge amount but only require the cooperation and technical knowledge sharing among the professionals. The major research funding agencies in India like AICTE, CSIR, ICMR, UGC, and other organizations, etc, may insist their affiliated bodies to design and develop an Institutional Repository. The CSIR also has a plan to setup a national digital repository of research literature. As if most of the research being carried out with the help of public fund. In turn the scholars may publish their research outcomes for the benefit of research communities and general public.

National knowledge commission suggested the higher education and R&D sectors should devise guidelines and open access policies to improve effective access to research literature and to disseminate research literature to the seeking communities. To enhance the research trends in India the above said guidelines must be implemented, where by duplication or identical studies may be restricted. Also the researchers will get more précised and quality information, whereby high quality research output may be expected.

Indian research communities are now aware of the importance of open access electronic journals and they are utilising the benefits of open access archives. Open access movement in India is started moderately from a few institutions and now spreads all over as a number of institutions have joined together. The public-private partnership in this movement is also growing. The open access movement in India is acknowledged worldwide.

CONCLUSION

It is clear from this study that the institutional repository is a very powerful idea that can serve as an engine of change for institutions of higher education, and more broadly for the scholarly enterprises that they support. If IR is properly developed, it advances a surprising number of goals, and addresses an impressive range of needs. Some of the results seem clear, though there are also likely to be any number of unexpected consequences. This is an area where most of the education institutions need to invest aggressively, but where they also need to implement thoughtfully and carefully. The intellectual leadership from the faculty and the library working in partnership with a full understanding, then there will be a permanent change in the landscape of scholarly communication.

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