Institutional Repository Software and their Use by the National Institutions of India: A Survey

Nitesh Kumar Verma
Research Scholar
Deptt. of Library & Information Science
Mizoram University, Aizawl 796 006
Email: vermanite@gmail.com

Dr. Akhandanand Shukla
Assistant Professor
Deptt. of Library & Information Science
Mizoram University, Aizawl 796 006
Email: akhandanandshukla@gmail.com

Abstract:
Recent changes in ICT have opened new ways of information creation, organisation, storage, and dissemination for scholarly communication. The institutional repositories act as central digital archive to make research and intellectual outcomes of the institutions available online to their needy ones. The paper discusses the concept, need, pros and cons related to institutional repositories. Besides this, paper also discusses the survey results based on its framed objectives and concluded that DSpace & EPrints are most prevalent software for the purpose.

Keywords: Institutional Repositories, Digital Archives, DSpace, EPrints, Fedora, Greenstone

Introduction:

Computers have been everywhere on the globe since the late 1980s. More advancement of information & communication technology (ICT) has changed the world dramatically. Libraries have undergone an extreme change in the modes of access of information i.e. closed access to open access as well as in the modes of scholarly communication that is print to electronic form. There are very vast change in the information creation, classification, storing and dissemination. Libraries and information centres are the store house of human generated knowledge in the print and non-print form. To disseminate the organizational research outcomes like doctoral dissertations, theses, publications etc., libraries have started using Institutional Repositories (IR) software to make them available online inside and outside of the organisation.

The world's academic institutions have treasures in the forms of archives, print and non-print forms and in a variety of storage mediums. These treasures contain scientific, technological, cultural and historical assets basically unavailable to researcher and to the general public. The IRs was created to manage, preserve and maintain the digital intellectual output of institutions. Librarians and information professionals are taking initiative in planning, creating and managing IR for conservation and preservation of intellectual outputs and fulfilling their organizational goals.

The essence of IR is to make research and development publications available on the Internet. The IR was experimented by educational organisations and R&D institutions to disseminate their research and other publication outcomes. The management and sharing of organizational knowledge may lead to further academic growth and development. Published documents like journals, papers, articles, books, book chapters, patents, technical reports, etc. and unpublished documents like pre-prints, working papers, theses and doctoral dissertations are the main contents of an IR. The IR is now become an essential platform for sharing of organizational generated knowledge.

Meaning and Definition:

Institutional repositories are the digital collection of an institutional research and intellectual output

which generally contains in the form of articles, theses, dissertations, book chapters and audio visual form, etc.

According to Lynch[1] "It is a set of services which the organization offers to the members of its community or the management and dissemination of digital materials created by the institution and its community members and thus an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organization and access or distribution."

For establishing IR, following things must be taken into considerations:

a) Hardware: Server PC, Network, etc.
b) Software: OS, IR software like DSpace, EPrints, Greenstone, etc.
c) Trained staff: Skilled Professional who can handle IR installation, managing and development.
d) Content: Theses, dissertations, reports, book chapters etc.
e) Perpetual License: Author grants the right to the institution to preserve and distribute their work in the repository.

Availability of Institutional Repository Software:

There are number of IR software which has been used by number of academic & research institutions. The brief sketch of some well known and most prevalent IR software are given below:

A) Dspace[2]

DSpace is open source software used for creation of open access institutional repositories and developed by HP Labs & MIT Libraries in November 2002.

B) Eprints[3]

EPrints is open source software for creation of open access repositories that are compatible with Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) and developed by University of Southampton in 2000.

C) Greenstone[4]

Greenstone is open source, multilingual software package basically used for creation of digital libraries and repositories and developed by University of Waikato, New Zealand in 1999.

D) Fedora[5]

Flexible Extensible Digital Object Repository Architecture (FEDORA) is basically digital assets management software which is mainly used for IR, and Digital Archives; designed and developed by Researchers at Cornell University in 2003.

Table 1: Most Prevalent IR Software: Basic Information

Features	DSpace	EPrints	Greenstone	Fedora
Origin	MIT Libraries & HP	University of Southampton	University of Waikato	Cornell University & University of Virginia
Open Source	Yes	Yes	Yes	Yes
Language	Java	Perl	Perl	Java
Release date	Nov, 2002	2000	1999	May, 2003
OS	Cross-Platform	Cross-Platform	Cross-Platform	Cross-Platform
Database	PostgreSQL and Oracle	MySQL	GDBM	MySQL
Web Server	Apache/IIS	Apache	Apache	Tomcat

Need of the Institutional Repository (IR):

There are following needs for the establishment of an institutional repository:

a) To provide a central archive facility.

b) Increase the dissemination and impact of research outcomes.

c) For increasing institution's visibility, prestige, status and public value.

d) For wider and fast access.

e) Resource discovery.

f) Information asset management by institutions.

g) Store once, use many times.

Objectives of the Study:

The present study has following objectives:

a) To know the institutional repository software used by the national institutes of India.

b) To know the contents covered by institutional repositories of India.

c) To find out pros and cons of an institutional repository.

Scope of the Study:

The present study is confined with the use and benefits of institutional repository used by the National Institutes of India.

Methodology:

The National Institutes of India who are using IR software were collected from OpenDOAR[6]. The observation survey is found suitable to conduct the study. The data collected were analyzed and investigated carefully. From the analysis of data tables has been prepared and graphs has been plotted by using the suitable statistical software tools.

Analysis and Interpretation of Data:

In India, there are number of academic and research institutions using institutional repositories software. Following Table 2 display the list of national institutes of India those are using IR software.

Table 2: National Institutes of India & IR Software(s)

SN	Name of Institutional Repository	Name of the Institute	IR Software used	Content Covered
1.	Architexturez South Asia	ABA-NET	Architexturez	Articles; Books; Learning Objects; Multimedia; Special
2.	Archives of Indian Labour	V. V. Giri National Labour Institute	[Not specified]	Books; Multimedia; Special
3.	ARIES, Digital Repository	Aryabhatta Research Institute of Observational Sciences	DSpace	Articles; Conferences; Theses
4.	Eprints@CMFRI	CMFRI, ICAR	EPrints	Articles; Conferences; Theses; Books; Patents
5.	DeepBlue Knowledge Repository@PDPU	Pt. Deen Dayal Petroleum University	DSpace	Articles
6.	Delhi College of Engineering Repository	Delhi Technological University	DSpace	Articles; Learning Objects; Multimedia; Special
7.	Digital Knowledge Repository of Central Drug Research Institute(DKR@CDRI)	Central Drug Research Institute	DSpace	Articles
8.	Digital Library at Indian Statistical Institute, Bangalore	Indian Statistical Institute, Bangalore Centre	DSpace	Articles
9.	Dyuthi	Cochin University of Science & Technology	DSpace	Articles; Theses; Learning Objects
10.	Digital Repository of West Bengal Public Library Network	West Bengal Public Library Network	DSpace	Books
11.	DigitalLibrary@CUSAT	Cochin University of Science & Technology	DSpace	Articles; Conferences; Theses; Books; Learning Objects; Multimedia; Special
12.	DIR@IMTECH	Institute of Microbial Technology	EPrints	Articles; References; Theses
13.	DRS at National Institute of Oceanography	National Institute Of Oceanography	DSpace	Articles; Conferences; Theses
14.	DSpace @ GGSIPU	Guru Gobind Singh Indraprastha University	DSpace	Articles; Theses; Learning Object
15.	DSpace@GIPE	GIPE, Pune	DSpace	Books; Multimedia
16.	DSpace @ SDMCET	SDM College Of Engineering and Technology Dharwad.	DSpace	References; Theses; Books; Learning Objects
17.	DSpace@IITB	IIT Bombay	DSpace	Articles; Conferences
18.	DSpace@IIMK	IIM, Kozhikode	DSpace	Articles; Conferences; Theses
19.	DSpace at IUCAA	Inter-University Centre for Astronomy and Astrophysics	DSpace	Articles; Conferences
20.	DSpace at M S University	Maharaja Sayajirao University of Baroda.	DSpace	Theses

21.	DSpace at NCRA	IIT, Bombay	DSpace	Articles; Theses; Learning Objects; Multimedia
22.	DSpace at Vidyanidhi	University of Mysore	DSpace	English; Hindi; Kannada
23.	DSpace@IMSC	Institute of Mathematical Sciences	DSpace	Conferences; Learning Objects
24.	DSpace@INFLIBNET	Information and Library Network Centre	DSpace	Conferences; Learning Objects; Special
25.	DSpace@NITR	NIT, Rourkela	DSpace	Articles; Conferences; Theses; Books
26.	DSpace@TU	Thapar University	DSpace	Articles; Conferences; Theses
27.	DU EPrints Archive	University of Delhi	EPrints	Articles; Conferences; Theses; Books; Patents
28.	eGyankosh	Indira Gandhi National Open University	DSpace	Learning Objects
29.	ETD@IISc	IISc, Bangalore	DSpace	Theses
30.	EPrints@NML	National Metallurgical Laboratory	EPrints	Articles; Conferences; Theses; Books; Learning Objects; Patents
31.	EPrints @MDRF	Madras Diabetes Research Foundation	EPrints	Articles; Theses; Books
32.	EPrints@IARI	Indian Agricultural Research Institute	EPrints	Articles; Conferences; Theses
33.	EPrints@IITD	IIT, Delhi	DSpace	Articles; Theses
34.	EPrints@NII	National Institute of Immunology	EPrints	Articles
35.	EPrints@SBT MKU	Madurai Kamaraj University	EPrints	Articles
36.	Etheses - A Saurashtra University Library Service	Saurashtra University	EPrints	Articles; References; Theses
37.	IACS Institutional Repository	Indian Association for the Cultivation of Science	DSpace	Articles; Theses
38.	ICRISAT Open Access Repository	International Crops Research Institute for the Semi Arid Tropics	EPrints	Articles; Conferences; Learning Objects; Multimedia
39.	Bhagirathi	IIT, Roorkee	DSpace	Articles; Conferences; Multimedia
40.	Indian Academy of Sciences: Publications of Fellows	Indian Academy of Sciences	EPrints	Articles
41.	DSpace@IIA	Indian Institute of Astrophysics	DSpace	Articles; Theses; Multimedia; Special
42.	IIM, Kozhikode Digital Library	IIM, Kozhikode	Greenstone	References; Books; Multimedia
43.	Indian Institute of Petroleum Institutional Repository	Indian Institute of Petroleum, Dehradun	DSpace	Articles
44.	Institutional Repository of Intellectual Contributions of Delhi	Delhi Technological University	DSpace	Articles; Theses; Multimedia

45.	Institutional Repository@CSIO	CSIR-CSIO	EPrints	Articles; Conferences; Theses; Learning Objects; Multimedia; Special
46.	Institutional Repository@VSL	IIM, Ahemdabad	DSpace	Articles; Conferences; Theses; Multimedia
47.	IR@CECRI	CSIR-Central Electrochemical Research Institute	EPrints	Articles
48.	IR@NPL	CSIR - National Physical Laboratory	EPrints	Articles; Conferences; Books; Multimedia
49.	Kautilya@IGIDR	Indira Gandhi Institute of Development Research	DSpace	Conferences; Theses
50.	E-Repository@IIHR	ICAR, IIHR	DSpace	References; Special
51.	KNoor	University of Kashmir	DSpace	Articles; Conferences; Theses
52.	Librarians' Digital Library	DRTC, ISI, Bangalore	DSpace	Articles; Conferences; Theses; Multimedia
53.	Mahatma Gandhi University Theses Online	Mahatma Gandhi University	Nitya D'Arch	Theses
54.	DSpace@MDI	Management Development Institute	DSpace	Articles; Conferences; Books; Special
55.	NAL Repository	ICAST	EPrints	Articles; Conferences; Theses; Learning Objects; Multimedia; Patents
56.	NSDL	NISCAIR	DSpace	Books
57.	EPrints@NIRT	National Institute for Tuberculosis Research	EPrints	Articles; References; Conferences; Theses; Books
58.	NISCAIR Online Periodical Repository	NISCAIR	DSpace	Articles; References
59.	OpenAgri	Agropedia, IIT Kanpur	[Not specified]	Articles; Conferences; Books
60.	EPrints@IISC	IISc, Bangalore	EPrints	Articles; References; Conferences; Books; Patents; Special
61.	OpenMED@NIC	Bibliographic Informatics Division, NIC	EPrints	Articles
62.	OUDL	Osmania University	DSpace	Articles
63.	RRI Digital Repository	Raman Research Institute	DSpace	Articles; Learning Objects
64.	EPrints@SVNIT	Sardar Vallabhbai National Institute of Technology	EPrints	Articles; Conferences
65.	ShodhGanga	INFLIBNET	DSpace	Theses
66.	Social Science Cyber Library	Aligarh Muslim University	CALIBRE	Articles; Theses; Books
67.	EPrints@UoM	University of Mysore	EPrints	Articles
68.	Vidya Prasarak Mandal Thane	Vidya Prasarak Mandal	DSpace	Articles; Conferences; Learning Objects; Multimedia

Table 3: IR Software & No. of Users in In

Name of Software	No. of Users
DSpace	42
EPrints	20
Architexturez	01
CALIBRE	01
Nitya D' Arch	01
Greenstone	01
Not Specified	02

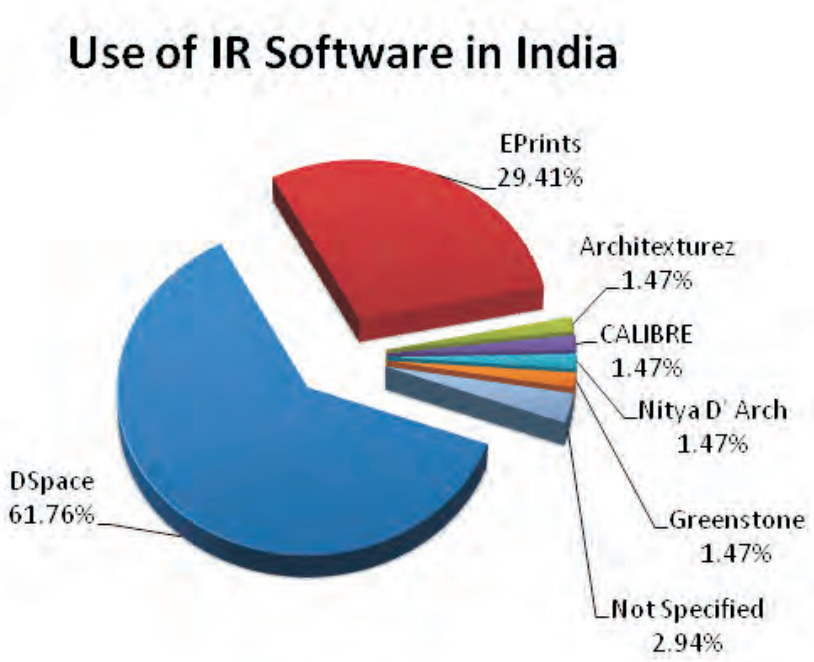

Fig. 1: IR Software used by National Institutes of India

On the analysis of Fig.1, it was found that DSpace (62%) and EPrints (29%) are most used IR software amongst Indian institutes whereas Greenstone, Calibre, Nitya and Architexturez like IR software has shown their presence.

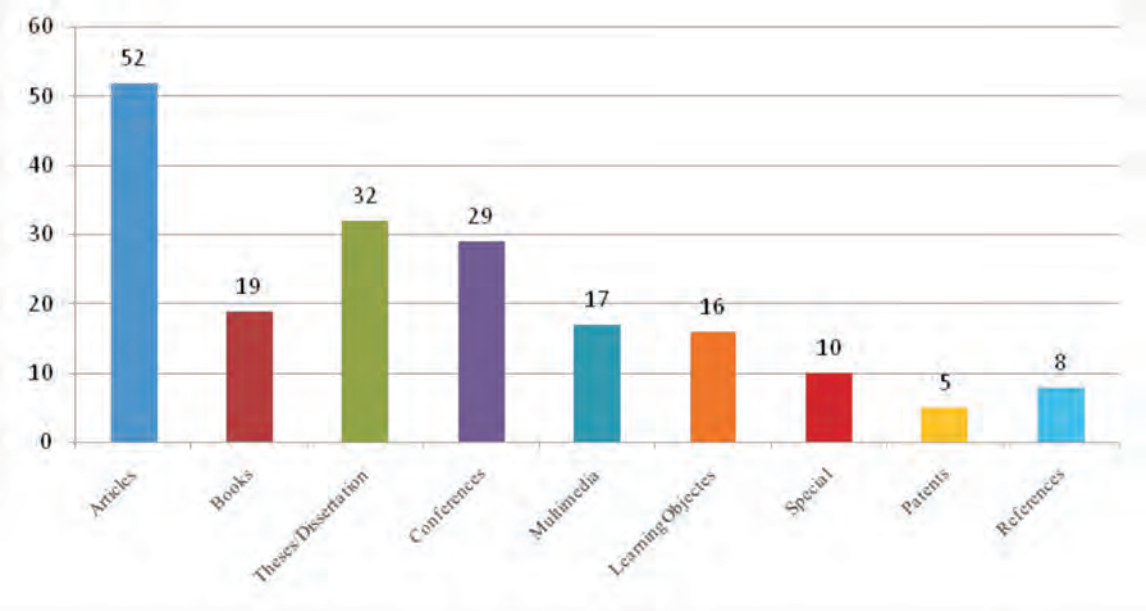

Fig. 2: Coverage of Content vs No. of IRs in India

After analysing the coverage of content by established IRs in India, it has been found that Articles (52) are most prevalent content for IRs followed by Theses/Dissertations (32),

Conference Articles (29), Books (19), Multimedia (17), Learning Objects (16), Special Documents

(10), References (8) and Patents (5).

Advantages of Institutional Repository:

a) Opening outputs of the institution to the globe.
b) Wider, faster access and visibility of organisational archives.
c) Preserve institutional heritage.
d) Managing and measuring research outcomes.
e) Best way to scholarly communication.
f) Increase the citation to the organisation research output.

Disadvantages of Institutional Repository:

a) Publishers unbending behaviour towards copyright policy.
b) Installation and customization of open source software is a big problem.
c) Variety of content like language, content format, etc.
d) Lack of organisation interest.
e) Lack of trained professionals in India.
f) Lack of funds for IT infrastructure and manpower.

Discussion:

India has been shown remarkable growth in establishment of Institutional Repositories since last fifteen years. There have been 68 functional IRs in India. This emerges due to emergence of open access initiatives and open source movement in all over the world. There are many open source and commercial IR software. Analysis has shown the DSpace & EPrints are mostly used IR software among all IR software. Three new IR softwares have come up in the field namely CALIBRE, Nitya D'Arch, and Architexturez. Further analysis has shown individual articles/research papers, theses/dissertations, conference proceedings, e-books, and multimedia items have been the prime focus of the IRs in its scope of content coverage. There are many pros and cons with the IRs but we cannot ignore its cultural, social, and academic benefits.

Conclusion:

The library and information science professionals in developing countries like India need to be more aware of new opportunities provided by these technologies. Everyday published and unpublished content is increasing so it's very difficult for the libraries to handle these information resources. Institutional Repositories acts as a digital archive for published and unpublished information resources of an organisation. Librarians and information professionals have to take initiative in planning, creating, and managing IR for conservation and preservation of intellectual outputs and fulfilling their organizational goals. It is very beneficial for academician, researcher, scientists, and students to provide them opportunity to access, communicate, and publish their intellectual output freely.

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