

## **Development of Institutional Repositories in the context of India**

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**Abstract:** IR's are developed to manage, preserve and maintain the research output, digital materials and historical information of the country. IR's are self-archived and open access to the materials of an organisation. This article focuses on present trends and status of the IRS of India. The study states that R & D institutions are the major creators of IRs and Karnataka state having highest number IRs in the Indian sub-continent. It is also observed that Dspace and Eprints software's are the commonly used IR software's in India. The public libraries have also taken initiatives to develop IRs of publically important information and the public libraries have to put more effort in IRs development. In Indian universities the IR research is very slow, only few universities having their IRs and other universities has to take initiatives to develop their IRs.

**Keywords:** Open Source Software, institutional repositories, directories, India, Dspace

### **Introduction:**

Institutional Repository is a digital archive of the research output created by the faculty, research staff, and students of an institution and accessible over the internet to end-users both within and outside of the institution, with few if any barriers to access. As a facility it consists of hardware, software and procedures to capture, organize, archive, disseminate and manage digital research resources of the institution. IRs provide a simple, web-based mechanism to researchers to deposit (Self-archive) and access their research publications.

There are many benefits that can accrue from the creation and implementation of institutional repositories. One is that the institute or university will be able to maintain a centralized collection of its output. This obviously depends on the type of IR – whether it is for research outputs (thesis, dissertations, working reports, published papers etc.) or for entire institutional output beyond the academic and research based. This means that output that is of value, and that would otherwise be lost to the institution is compiled and made available for

current and later use by members of the institutions and indeed others who might have an interest. Generally universities and research institutions produce a lot of output materials that may not be published and therefore accessible.

The world's universities, museums, governments, and other organizations house treasures that have been hidden in archives, basements, attics, print formats, and a variety of storage devices. Institutional repositories are now being created to manage, preserve, and maintain the digital assets, intellectual output, and histories of institutions. (Lohrii & Kogauramath, 2006)<sup>1</sup>. An institutional Repository is an online locus for collecting, preserving, and disseminating the intellectual output of an institution, particularly a research institution. For a university, this would include materials such as research journal articles, before and after undergoing per review, and digital versions of thesis and dissertations. It might also include other digital assets generated by normal academic life, such as administrative documents, course notes, or learning objects.

An institutional repository consists of formally organized and managed collections of digital content generated by faculty, staff and students at an institution. The content of these repositories can be available for integration with on-campus library and course management systems, and can also be made available to colleagues and students at other institutions, as well as to the general public. A convenient definition is a “digital collection capturing and preserving the intellectual output of a single or multi-university community” (Crow)<sup>2</sup>.

### **Objectives of the Study:**

- ❖ To know and enumerate the Institutional Repositories in India
- ❖ To analyze the 118 IRs based on selected study criteria, as follows
  - Types of institute,
  - Regional wise implementation,
  - Statues of Indian state,
  - Software used for repositories,
  - Year of implementation,
  - To compile the web directory of IRs.

The study hopes to enlighten awareness of Institutional Repositories being developed in India and its contribution to a global knowledge base.

**Research Methodology:**

Total 118 Institutional Repositories was selected and browsed for the present paper. The data related to the institutional repositories have been collected from their respective websites, and other secondary sources like OpenDOAR and ROAR web directories. The data is analyzed based on selected parameters like software used for repositories, types of institutions, statues of Indian states, year of implementation and related its future prospective.

**Review of Literature:**

In India, various open access initiatives have been undertaken and are operational. Some more are in developmental stage. Some initiatives have also been taken in the area of metadata harvesting services. Gradually, there has been a realization of the usefulness of the open access by various institutions particularly, the public funded ones. The future of open access in India is dependent upon a proper policy and a framework (Ghosh, 2006)<sup>3</sup>. In the implementation of open access LIS professionals should play a pro-active role in the growth of collection in the institutional repositories. Institutional repository is a very powerful idea that can serve as an engine of change for our institutions of higher education, and more broadly for the scholarly enterprises that they support. If it properly developed, it advances a surprising number of goals, and addresses for an impressive range of needs (Sinha, 2006)<sup>4</sup>. Institutional repositories are a practical, cost-effective and strategic means for institutions to build partnerships with their faculty and researcher communities of posting their research online for expanded exposure and access to their work (Lohrii, 2006)<sup>5</sup>.

In general, most IRs is based in colleges and universities, although they do to a lesser extent exist in government agencies. In most universities, these IRs are spearheaded and manned by university libraries. When IRs was first mooted, the major consideration was to address the rising serials costs and provide another avenue for scholarly research. Some through saw IR's as a means of providing management and preservation of research output (Kgomotso, 2009)<sup>6</sup>. The emergence of computer communication technology has accelerated and offers great opportunities to fast, cost effective and efficient electronic communication. In addition, universities and other institutions across the globe are building up their own institutional repository centre. Therefore, librarians and library professionals should take initiative and come up with institutional repositories so that researchers and the scholars can access the scholarly publishing materials. It also highlights the development of institutional repositories and its role (Thoudam and Keisham,

2006)<sup>7</sup>. The development of a digital library created and maintained by an academic library, and its gradual change into a de facto institutional repository. Other libraries in the planning stages or initial steps of creating a campus wide digital library or an institutional repository can benefit from the description of possible successes and problems that they could encounter during implementation (Buehler and Marcia)<sup>8</sup>.

The institutional repositories are a very powerful idea that can serve as an engine of change for any institution. In this digital age, everyone wants contents and to be successful information service providers. So, information centre and libraries needs to develop services in such a way so that the end users may manipulate the content, as per their requirements (Ajay and Nimai, 2008)<sup>9</sup>. Institutional repositories are digital collections that capture, collect, mange, disseminate and preserve scholarly work created by the constituent members in individual institutions. The establishment of IR in the developing countries ensures that their national research becomes main stream and contributes on an equal footing to the global knowledge pool (Shalini and Ajay)<sup>10</sup>. Institutional repositories are the result of such programmes which make available the archival collections over networks to its users. In addition, they also provide direct output of an institutions research contribution in digital format for quick access of the users (Anil and Hemant)<sup>11</sup>. Institutional repositories offer a strategic response to systemic problems in the existing scholarly journal system and the response can be applied immediately, reaping both short-term and on-going benefits for universities and their faculty and advancing the transformation of scholarly communication over the long term (Richard)<sup>12</sup>.

There are many world renowned open source IR software's available such as Eprints, DSpace, FEDORA, ARNO, i-TOR, CDSWare etc. Each of this software has a host of features, unique facilities and excellent capabilities, which the users could explore and experiment upon (Sreekumar and Suntiha)<sup>13</sup>. Software is a critical digital content component that is generated on academic campus by way of mandatory course requirements (Gopi and Malati)<sup>14</sup>.

### **Key issues in developing repositories:**

Some of the key issues to consider when developing repositories are,

- 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.

### **Overview of existing Indian scenario:**

India is in the forefront of developing world as well as in South Asian region both in terms of economic growth and scientific productivity. Research and Development (R&D) institutions and higher learning institutions in India are engaged in advanced studies, leading to development of new applications, new techniques, new products and new technologies. The R&D organizations have also developed expertise in their respective areas that are now recognized worldwide. Such institutions are now collaborating with world's leading institutions with varying degree of partnerships. Leading Indian scientific institutions, such as Indian Institute of Science (IISc), Indian Institute of Technology (IITs), Indian Statistical Institute (ISI), institutions under the Council of Scientific and Industrial Research (CSIR) and Indian Council of Medical Research (ICMR) now have considerably greater in-flows of sponsored research, supported by industries, enterprises, as well as international and national funding agencies. The associated problem is mainly related to the accessibility of literature. The reason is primarily shrinking budget. There is paucity of funds for the primary literature, i.e. subscription based scholarly journals. The subscriptions of scholarly periodicals, especially the high impact journals are also increasing very rapidly, at the same time library budgets almost remained same. The scholar's preference to publish in high impact journals for recognition in the elite world demands the necessity of acquiring such literature in the library. Here open access literature can play a vital

role, both in terms of research communication and access, provided of course the benefits in terms of economic and social recognition are assured by this system. The ICT infrastructure necessary to take advantage of the open access is not adequate in developing countries, as are apparent in many cases.

**Current IR Developments in India:**

In India, the efforts towards adopting open access initiative have already been started. But there are some hurdles and misunderstandings about open access among the Indian research community. These are

- Lacks of expertise in every organization to promote creation of institutional archives and encourage scientists to place their papers in them.
- Lack of infrastructural facilities like hardware and connectivity of high bandwidth.
- Scientists are under the impression that the editors of renowned journals may not accept the archived papers.
- The scientists are not aware of the fact that the attitudes of the journals are now changing and renowned journals also permit the authors to archive both preprints and post prints. <sup>[16]</sup>

**Table – 1 Institutions wise Distribution**

<b>Sl. No.</b>	<b>Type of Institution</b>	<b>No. of IRs</b>	<b>%</b>
1	Research and Development (R&D)	47	39.83
2	Universities	33	27.96
3	Institute of Technology and Management	22	18.64
4	Information Resource Centres	9	7.62
5	Government Organizations	5	4.23
6	Public Libraries	1	0.84
7	Private Companies	1	0.84
	<b>Total No. of IRs</b>	<b>118</b>	<b>100</b>

The table 1 depicts that, R & D institutions is having more number of IRs i.e. 47 (39.83%), followed by Universities 33 (27.96%), and Institute of Technological and Management Institutions 22(18.64%) are providing open access services to the user through using the open source softwares. It is inferred that R & D and Universities are adopted the institutional repositories due to generation large

amount of knowledge or information and they have managed their institutional intellectual output by using IRs.

**Table 2 – State wise Distribution**

<b>Sl. No.</b>	<b>Name of the state</b>	<b>No. IRs</b>	<b>%</b>
1	Karnataka	27	22.88
2	Haryana	25	21.18
3	Kerala	12	10.16
4	Maharashtra	12	10.16
5	Tamil Nadu	08	6.77
6	West Bengal	07	5.93
7	Gujarat	06	5.08
8	Utter Pradesh	04	3.38
9	Goa	03	2.54
10	Orissa	03	2.54
11	Andhra Pradesh	03	2.54
12	Jharkhand	01	0.84
13	Jammu and Kashmir	01	0.84
14	Pondicherry	01	0.84
15	Meghalaya	01	0.84
16	Uttarakhand	01	0.84
17	Other	03	2.54
	<b>Total</b>	<b>118</b>	<b>100</b>

The table 2 indicates that state wise implementation of Institutional Repositories in India, in Karnataka 27 (22.88%) institutions was implementation of Institution Repositories, Haryana (New Delhi-Union territory) 25 (21.18%), Kerala 12 (10.16%), and Maharashtra 12 (10.16%) get into 4<sup>th</sup> highest institutes was implementation of Institutional Repositories.

**Table – 3**

**Software wise Distribution**

<b>Sl. No.</b>	<b>Name of the Software</b>	<b>No. IR's</b>	<b>%</b>
1	Dspace	76	64.40
2	Eprints	30	25.42
3	Greenstone	1	0.84
4	Others	11	09.32
	<b>Total No. of IR's</b>	<b>118</b>	<b>100%</b>

The above table 3 shows that, among 118 IR's Dspace 76 (64.40%) is the most commonly used open source institutional repository software in India, followed by Eprints software 30 (25.42%).

**Table 4****Establishment year wise distribution**

Sl. No.	Year of Establishment	No. of IR's	%
1	2004	7	05.93
2	2005	7	05.93
3	2006	12	10.16
4	2007	10	08.47
5	2008	19	16.10
6	2009	21	17.79
7	2010	26	22.03
8	2011	16	13.55
	<b>Total Number of IR's</b>	<b>118</b>	<b>100%</b>

The table 4 shows that year wise establishment of IR's of various organizations in India. In the year 2010, 26 (22.03%) highest no of organization have established their IR's in India. In the year 2009 21 (17.79%), 2008 19 (16.10%), and in the year 2011 16(13.55%) have tremendous growth in the establishment of IR's in various organization of India.

**Present Indian Institutional Repositories**

In India, the tradition of Science & Technology is over 5,000 years old. India is the third highest higher education system in the world with 431 universities, 20,677 colleges, 7,000 technical and 1,500 research institutions. The council of Scientific and Industrial Research run 37 public funded research laboratories, 109 Research and Development institutions at present engaging in different disciplines.

**Repositories of Research and Development institutions in India**

Research and Development (R & D) institutions and higher learning institutions in India are engaged in advanced studies, leading to development of new applications, new techniques, new products and new technologies. The R&D

organizations have also developed expertise in their respective areas that are now recognized worldwide.

The Table 5 clearly states that, 46 IR's are established by R & D institutions out of 109 institutions of R&D institutions in India. Some of the prominent institutional repositories of India are listed as below.

**Table 5**

<b>Sl. No.</b>	<b>Name of the Institute</b>	<b>URL of IR</b>	<b>State</b>	<b>Software Used with version</b>
1	Indian Institute of Science	<a href="http://eprints.iisc.ernet.in">http://eprints.iisc.ernet.in</a>	Karnataka	Eprints
2	Central Marine Fisheries Research Institute	<a href="http://eprints.cmfri.org.in">http://eprints.cmfri.org.in</a>	Kerala	Eprints V.3.1.3
3	National Institute of Oceanography	<a href="http://drs.nio.org">http://drs.nio.org</a>	Goa	Dspace
4	National Aerospace Laboratories	<a href="http://nal-ir.nal.res.in">http://nal-ir.nal.res.in</a>	Karnataka	Eprints V2.3.6
5	National Metallurgical Laboratory	<a href="http://eprints.nmlindia.org">http://eprints.nmlindia.org</a>	Jharkhand	Eprints V2.3.6
6	National Centre for Catalysis Research	<a href="http://203.199.213.48/">http://203.199.213.48/</a>	Tamil Nadu	Eprints V3.0.1
7	National Chemical Laboratory	<a href="http://dspace.ncl.res.in">http://dspace.ncl.res.in</a>	Maharashtra	Dspace
8	Central Research Drug Institute	<a href="http://dkr.cdri.res.in:8080/dspace">http://dkr.cdri.res.in:8080/dspace</a>	West Bengal	Dspace
9	Indian Agricultural Research Institute	<a href="http://eprints.iari.res.in">http://eprints.iari.res.in</a>	Haryana	Eprints V3.1.3
10	Institute of Minerals and Materials Technology	<a href="http://eprints.immt.res.in">http://eprints.immt.res.in</a>	Orissa	Eprints V3.1.3
11	Central Institute of Medicinal and Aromatic Plants	<a href="http://203.190.147.121/index.jsp">http://203.190.147.121/index.jsp</a>	Utter Pradesh	Dspace
12	Central Salt & Marine Chemicals Research Institute	<a href="http://www.csmcri.org/pages/Resources/KRC_Library.php">http://www.csmcri.org/pages/Resources/KRC_Library.php</a>	Gujarat	Dspace
13	Medical and Allied	<a href="http://openmed.nic.in">http://openmed.nic.in</a>	Haryana	Eprints

	Sciences			V3.1.2
14	NISCAIR Online Periodicals Repository (NOPR)	<a href="http://nopr.niscair.res.in">http://nopr.niscair.res.in</a>	Haryana	Dspace
15	Physical Research Laboratory	<a href="http://www.prl.res.in/~Library">http://www.prl.res.in/~Library</a>	Gujarat	Greenstone

### IRs of Indian Universities

Universities are back bone of the higher education system, current universities were developed in a bygone era to satisfy the needs of that time. The today's main issue is to open up the elite university to the masses of young people and to adjust to today's democratic, pluralistic society, and at the same maintain the standard of teaching and research. Out of 431 universities only 33 universities are established their institutional repositories in India. Indian universities are facing some problems in implementing the IRs due to lack of knowledge about the IR implementation, lack of human resources, financial issues, and the researchers or faculties of the universities are not ready to submit their research output in their IRs because of copyright issues and willingness to submit.

### Government Organizations

Right now in India central government organizations are 567, State Government Organizations are 637, Government Departments are 480, International Organizations are 21, Judiciary are 75, Railway's are 48, Trade Promotion Organizations are 94, working for fields and providing online information related to various government organizations providing services in the field of education, infrastructure development, Science and Technology, Agriculture, and Scientific Research etc. But only 5 organizations are having institutional repositories to facilitate open access to information.

### Public Libraries

**Table 6**

Sl. No.	Name of the Institute	URL of IR	State	Software Used with version
1	West Bengal State Central Library	<a href="http://dspace.wbpublibnet.gov.in/dspace">http://dspace.wbpublibnet.gov.in/dspace</a>	West Bengal	Dspace

Table 6 shows that, only one public library having their institutional repository out of 28 State Public Libraries, 451 District Public Libraries. The public libraries beyond in implementing IR's because lack of awareness among the library staff, financial problems, lack of human resources and the interest of library staff to implement the IR's in their libraries.

### Challenges for Implementation of Institutional Repositories

1. A further challenge is the issue of copyright materials and the fact that authors who publish in journals usually sign copyright transfer forms that transfer copyright from the author to the publisher.
2. Technical issues also come into play as a challenge and include matters such as the format of items to be deposited, as well as the fact that software versions change and may not allow backward use.
3. Another challenge in building IR's is identified in the literature as ensuring that the IR has current that grows.
4. A lot of the challenges in increasing participation of academics and researchers in depositing content are succinctly articulated by Fitzgerald & Austin (2008).
5. Donovan & Watson (2008) also point out that for repositories that accept all output, published or not, one challenge may be posed by authors who want to deposit everything and anything.

### Findings

1. Most of the IR's India is developed by R & D institutes 47 (38.98%), followed by Universities 33 (27.96%) and Management & Technology institutes 22 (18.64%)
2. Among the 28 States, Karnataka state 27 (22.88%) and Haryana 25 (21.18%) states having more awareness in using IR's.
3. It is observed that Dspace 75 (64.40%) and Eprints 30 (25.42%) are most commonly used open source software's for Institutional Repositories.
4. Maximum numbers of institutions are using IR's for to promote research and to collect and preserve the research publications 67 (56.77%), e-Thesis and Dissertations 19 (16.10%), E-Journals 20 (16.94%).

5. Universities of India have to take initiative to implement the IR's to Research community, faculties and to the students. Only few universities (33) are having their repositories in India.
6. The numbers of Government Organizations and Public Libraries have to take initiative to implement IR's and to disseminate the publically needed information to the common man.

**Conclusions:**

Institutional Repositories offer the opportunity for libraries to collect, preserve, and disseminate the institutions scholarly output. Serving an important service to the community, institutional repositories offer many benefits to the institutions community and other communities of the world. Institutional Repositories make it possible to collect content in one location, capture and provide open access to the intellectual output of a institutions, as well as preserve content that may be otherwise unavailable or out of publication. It is essential to explore the benefits as well as the challenges of institutional repositories to make sure it is worthwhile to the library as well as the institutions.

In India, there are a number of open access initiatives in many forms, such as open access journals, archives of back volumes of journals, institutional repositories, subject specific repositories, document specific repositories, open courseware, etc., in India, some other related initiatives also available cultural heritage literature to the world. All these things are available in open access mode only, where costs of accessing scholarly materials reduced drastically. Providing global access to local research is another challenge of open access initiatives in India. Some studies and usage statistics of some repositories show that the researchers of developed nations are accessing the Indian literature available in the open access journals and archives. India is not only leading open access movement of the developing countries, but also making developed countries aware of qualitative scholarly originated from developing countries.

**References:**

1. Raym Crow, The case for institutional repositories: A SPARC position paper, available at <http://www.arl.org/sparc/IR/ir.html>
2. Gosh S.B. (2006). Open access and institutional repositories – a developing country perspective: a case study of India, World Library and Information

Congress: 72<sup>nd</sup> IFLA General Conference and Council, 20-24 August, Seoul, Korea.

3. Kgomotso H. Moahi (2009). Institutional Repositories: Towards harnessing knowledge for African Development, 1<sup>st</sup> International conference on African Digital Libraries and Archives (ICADLA-I), Addis Ababa, Ethiopia, 1-3 July, 2009.