RESEARCH

Open Access Digital Repositories: An Indian Scenario

Open access digital repositories give barrier-free access to literature for study and research to users worldwide. They solve the pricing and permission crises for scholarly materials. This paper deals with open access digital repositories in India. The results of the study reveal that the repositories contain both published and unpublished documents, like seminar proceedings, conference papers, theses, dissertations, research reports, books, and so on. The results also point out that open access digital repositories in India are mostly subject specific and commonly use open source information repository software like DSpace, Greenstone Digital Library Software, and GNU EPrints. It is observed that generally the open access digital repositories use OAI-PMH (protocol for metadata harvesting), so that they can be accessed using search tools such as Web search engines, whereas a few don't use it but provide direct access to their documents through their websites.

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Open access to scholarly information has been a hot topic of debate among librarians, scholars, and publishers over the last few years. The scholarly communication crisis encompasses two distinct though inter-related problems. On the one hand, serial-subscription costs, particularly for science and medical journals, have been increasing rapidly over the last two decades, often at rates far above the cost of inflation. At the same time, research library budgets have been decreasing, or are otherwise unable to keep pace with price increases. The result is that libraries are spending more, but they are in fact getting less in terms of journal titles and new monograph acquisition, as more of the budget is consumed by serial subscriptions, so even the richest university libraries cannot afford to subscribe to most of the journals that their faculty need for their research and teaching (Chan, 2004). The only solution to these problems is open access to scholarly information. Open-access (OA) literature is digital, online, free of charge, and free of most copyright and licensing restrictions. The main aim of open access is to facilitate the free flow of refereed literature among researchers in different disciplines over the Internet. There are a variety of definitions of "open access," and the concept is still evolving; however, several key documents, which build upon each other, collectively comprise the best current definition of this term.

On his website, Peter Suber mentioned that *"By 'open access' we mean the free availability of literature on*

the public Internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited."

Completely open access removes price barriers (subscriptions, licensing fees, pay-per-view fees) and permission barriers (most copyright and licensing restrictions).

Open access is online access, but it does not exclude print access to the same works.

Open access is free of charge to readers, but it does not exclude priced access to print versions of the same works, because print editions are expensive to produce, they tend to be priced rather than free. Open access does not exclude printouts by users or print archives for security and long-term preservation. Open access helps to ensure long-term access to scholarly articles. Unlike articles that are licensed in traditional article databases, libraries and others can create local copies and repositories of these resources. Libraries, by working together to make repositories of open access literature, can ensure continued access to these scholarly publications into the distant future. The Digital Repository is one type of open access source where literature is available free of cost in digital form. A Digital Repository is a collection of digital resources

that can be accessed through the Internet and intranet to retrieve information. The British Library defines Digital Repository as *"An organization that has responsibility for the long-term maintenance of digital resources, as well as for making them available to communities agreed on by the depositor and the repository."*

Open Access Digital Repositories have already started emerging in different parts of the world. The University of Nottingham (UK) and Lund University (Sweden) officially launched OpenDOAR (Directory of Open Access Repositories) on January 27, 2006. OpenDOAR presently contains 792 repositories belonging to different countries of the world. Several enablers have motivated the development of open-access publishing. These include global movements and initiatives for open access like the Open Archives Initiative, the Budapest Open Access Initiative, Scholarly Publishing and Resources Coalition, and Free Online Scholarship, as well as initiatives undertaken by International Council for Science (ICSU) and UNESCO. Other important enablers are the availability of free online publishing and digital repository management software such as Greenstone Digital Library Software, and protocols for metadata harvesting, like OAI-PMH. Using these standard protocols for metadata allows interoperability among the repositories for sharing information and providing centralized services. Much has been said about the

value of open-access publishing in developing countries. Open-access publishing enables researchers in developing countries to establish priority for their research, which they could use later to defend their intellectual property. It removes access barriers in terms of both price and permission, enhances national research capacity, and improves visibility for developing-country research. Open access thus enables a global platform for this research and collaboration, and reciprocates the information flow from South to North and East to West among all countries.

Objectives of the Study

The main objective of the study is to provide comprehensive information about the open access digital repositories in India.

Scope of the Study

The present study covers the open access digital repositories in India. Some of the repositories are multidisciplinary in coverage and some are subject specific.

Methodology

The study was completed in three stages using the observation method. In the first stage, a list of the open access digital repositories of India was prepared by accessing different sources, like the "Directory of Open Access Repositories" on the Internet. In the next stage, the selected repositories were evaluated to obtain the required information regarding them. However, a few repositories that were not accessible in the aforesaid period due to some technical problems were excluded. In the final stage, the collected

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data was presented in tabular form, and categorized under different headings, like subject, language, documents available, number of items, software used, etc. to depict the findings.

Open Access Initiatives in India

In India, there are many noncommercial research and development institutions, both academic and research laboratories. For example, there are more than 300 universities that offer both graduate and research programs. There are also many R&D laboratories operating within government science agencies that cover domains like industrial research, defense research, agricultural research, medicine, ecology, the environment, information technology, space, energy, and ocean development. These institutions produce a good amount of literature on almost all branches of knowledge. Some of these institutions, like the Indian Institute of Science, Bangalore; the Indian Institute of Management, Kozhikode; the Indian Statistical Institute, Bangalore; the Indian Institute of Technology, Delhi; the National Institute of Technology, Rourkela; the National Aerospace Laboratories, Bangalore; the National Chemical Laboratory, Pune; the Information and Library Network (INFLIBNET), Ahmedabad; the National Institute of Oceanography, Goa; the Raman Research Institute, Bangalore; etc., have established open access Institutional Repositories (IRs) that disseminate the research outputs of the respective institutions. Sometimes, these are self-archived. Otherwise, the administrator of the repositories collects research documents from different sources and submits the documents to the IR on behalf of the organizations concerned (Rajasekhar, 2003). *Table 1* lists the digital repositories covered in this study.

Findings

1. The movements towards open access initiatives have started in various states of India. The institutes of different backgrounds have taken initiatives to establish open access digital repositories, and libraries are playing a key role.

2. Most of the open access digital repositories are subject specific, dealing with a particular branch of knowledge (e.g. DSpace at the National Chemical Laboratory, Pune) and some are multidisciplinary (e.g. Digital library at the Indian Statistical Institute, Bangalore).

3. The collection in the open access digital repositories is smaller and the growth rate is slower. The collection in most of the repositories is less than 2,000.

4. All the digital repositories in India contain documents in English, but a few contain collections in Hindi and Kannada as well.

5. The digital repositories contain both published and unpublished documents, like articles, seminar proceedings, conference papers, theses, dissertations, research reports, books, etc. Some special materials, like learning objects, multimedia documents and patents, are also found in some of the open access digital repositories.

6. A few document type-specific institutional repositories also exist, where scholars of different subjects can contribute their

Table 1: Selected Open Access Digital Repositories in India

Name	Organisation	Website	Subject	Language	Documents available	No. of Items	Software Used	OAI-PMH Compliant	E-mail Alerts
Digital library at Indian Statistical Institute, Bangalore	Indian Statistical Institute, Bangalore	http://library.isibang.ac.in:8080/dspace	Multidisciplinary	English	Publications	191	DSpace	No	Yes
DRS at National Institute of Oceanography (BRS@nio)	National Institute of oceanography, India	http://drs.nio.org/	Multidisciplinary	English	Publications; Conferences; Theses	427	DSpace	Yes	No

Name	Organisation	Website	Subject	Language	Documents available	No. of Items	Software Used	OAI-PMH Compliant	E-mail Alerts
DSpace at Indian Institute of Management Kozhikode (dspace@IIMK)	Indian Institute of Management, Kozhikode	http://DSpace.iimk.ac.in	Business & Economics	English	Publications; Conferences; Theses; Unpublished	175	DSpace	Yes	Yes
DSpace at National Chemical Laboratory (dspace@NCL)	National Chemical Laboratory, Pune	http://dspace.ncl.res.in	Chemistry & chemical technology	English	Theses; Patents; Project reports	357	DSpace	Yes	Yes
DSpace@INFLIBNET	Information and Library Network, India	http://dspace.inflibnet.ac.in	Multidisciplinary	English; Hindi	Special; Conferences; Learning objects	428	DSpace	Yes	Yes
DSpace @NITR	National Institute of Technology, Rourkela	http://dspace.nitrkl.ac.in/dspace	General Sciences	English	Publications; Conference papers; Preprints	318	DSpace	Yes	Yes
DU EPrint Archive	University of Delhi	http://eprints.du.ac.in	Multidisciplinary	English	Preprints; Conference papers; Books; Patents	115	GNU EPrints	Yes	No
EPrints@IIT Delhi	Indian Institute of Technology, Delhi	http://eprint.iitd.ac.in/dspace	Science & Technology	English	Convocation addresses; Faculty research publications	1,856	DSpace	No	Yes
ETD at IISc	Indian Institute of Science, Bangalore	http://etd.ncsi.iisc.ernet.in/	Multidisciplinary	English	Theses and Dissertations	191	DSpace	Yes	Yes
ETD@IIT Bombay	Indian Institute of Technology, Bombay	http://www.library.iitb.ac	Science & Technology	English	Theses and Dissertations	3,000	Greenstone	No	No
ETD@IIT Kanpur	Indian Institute of Technology, Kanpur	http://library.iitk.ac.in:8080/examples/thesis/index.html	Science & Technology	English	Theses and Dissertations	8,867		No	Yes
Indian Institute of Astrophysics Repository (dspace@IIA)	Indian Institute of Astrophysics, Bangalore	http://eprints.iiap.res.in	Physics & Astronomy	English	Theses; Publications: Multimedia: Special	1,196	DSpace	Yes	Yes
Indian Institute of Management Khozhikode Scholarship Repository (EPrints@IIMK)	Indian Institute of Management Khozhikode	http://eprints.iimk.ac.in	Multidisciplinary	English	Preprints: Unpublished	170	GNU EPrints	Yes	No
LDL: Librarians Digital Library	Documentation Research Training Centre, Bangalore	https://drtc.isibang.ac.in	Library & Information Science	English; Hindi; Kannada	Publications; Conference papers; Theses; Multimedia	257	DSpace	Yes	Yes

Name	Organisation	Website	Subject	Language	Documents available	No. of Items	Software Used	OAI-PMH Compliant	E-mail Alerts
National Aerospace Laboratories Institutional Repository (NAL Repository)	Information Centre for Aerospace Science and Technology, India	http://nal.ir.nal.res.in	Science and Technology	English	Publications; Conference papers; Theses; Multimedia; Patents;	1,781	GNU EPrints	Yes	Yes
One World South Asia Open Archive Initiative	One World South Asia Open Archive Initiative (OWSA), India	http://eprints.iisc.ernet.in/	Information and Communication Technology	English	Publications; Conference papers; Theses; Unpublished; Books; Patents	88	GNU EPrints	Yes	Yes
Open access Repository of IISC research publications (EPrints@IISC)	Indian Institute of Science, Bangalore	http://eprints.iisc.ernet.in	General Sciences	English	Publications; References; Conference papers; Books; Patents; Special	5,669	GNU EPrints	Yes	No
Open MED@NIC	National Information Centre, India	http://openmed.nic.in	Health & Medicine	English	Publications	1,277	GNU EPrints	Yes	No
RRI Digital repository	Roman Research Institute, India	http://dspace.rri.res.in/dspace	Physics & Astronomy	English	Post prints; Unpublished; Learning objects	1,405	DSpace	No	Yes

documents based on type. ETD@ IIT Bombay is a good example of a document type repository where scholars can deposit their theses and dissertations.

7. As for software, most repositories use open source information repository software like DSpace, Greenstone Digital Library Software, and GNU EPrints, whereas some repositories like ETD@IIT Kanpur are not using any IR software.

8. Most of the open access digital repositories use OAI-PMH (protocol for metadata harvesting), so that these can be accessed using search tools like search engines on the Web, whereas a few don't use it but provide direct access to their documents through their respective websites (e.g. EPrints@IIT Delhi).

9. Most of the open access digital repositories provide e-mail alerts to registered users when a new document is added to the repository, but in some repositories, this facility is not available.

Conclusion

The open access digital repositories have become platforms for the sharing of knowledge because they provide access to research documents and other learning materials free of cost. These repositories have overcome the financial, geographical, institutional, and political boundaries and barriers of permission, time, and space between user and information. To keep the repositories fruitful, their collections should be updated constantly, and their use should be increased through postings on list servers, web search engines, metadata harvesting services, and through publicity campaigns. Indians should realize the importance of information repositories in the modern digital era. They must take steps to develop the existing ones in all spheres, and establish new ones in all areas of the country.

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