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Open Access and Institutional Repository (IR) or Digital Library (DL)

✉ Ravindra Suryakant Kale

1. Introduction:

Libraries aim to ensure free access to global knowledge for all citizens, and particularly to education, science, and scholarship. In order to achieve this they obtain a selection of the academically relevant publications and store them for future use and unrestricted access. This selection reflects the plurality and diversity of science, scholarship, and society, and is in accordance with the specific needs of its current and future users.

Traditional free access to printed books:

The library purchases the book with a one-off payment, and the reader can then borrow it free and as many times as desired. The library stores it for further use. This is economical and effective. Other printed materials such as articles in academic journals are used within the library, or copies are made for research work at home. If students and scientists need specific literature, it can be ordered from other libraries through electronic catalogues with Internet library.

This has changed. Besides printed publications, libraries now buy content in the form of e-books and electronic journals. In contrast to printed books, these may not be stored in the library permanently and made available to users repeatedly. Libraries can only provide access within the library or on a university campus as long as they pay the license fee regularly. Readers are allowed to 'borrow' e-books by downloading them from the Web.

Licenses have suddenly become vastly more expensive. Many university libraries are thus no longer able to obtain them to a sufficient degree in order to supply their scientists and scholars. Many important

electronic full-text databases for the natural sciences, technology, and medicine are extremely expensive and so scientists with a small budget can no longer afford access to current knowledge.

Open Access allows libraries to make academically relevant publications available in a lasting manner and at any time. Libraries are working towards this development. It is their contribution to education, research and science and their way of ensuring that everyone can participate in global knowledge.

Open Access is necessary in order to overcome the digital divide in our society. The December 2003 declaration of the International Federation of Library Associations and Institutions (IFLA) on Open Access (IFLA) Statement on Open Access to Scholarly Literature and Research Documentation (<http://www.ifla.org/V/cdoc/open-access04.html>) points to the significance of the global network of services provided by libraries to ensure access to scientific literature from the past, present and future.¹ IFLA (International Federation of Library Associations and Institutions) supports definition of Wellcome Trust is described as:

An open access publication is one that meets the following two conditions:

1. The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, world-wide, perpetual (for the lifetime of the applicable copyright) right of access to, and a license to copy, use, distribute, perform and display the work publicly and to make and distribute derivative works in any digital medium for any reasonable purpose, subject to proper attribution of authorship, as well as the right to make small numbers of printed copies for their personal use.
2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving.

An open access publication is a property of individual works, not necessarily of journals or of publishers. Community standards, rather than copyright law, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published work, as they do now.²

2. Vehicles of Open-Access Literature:

The Open Access Initiatives can have visible impact on academic community, institutions, industries, and librarians. There are three primary vehicles for delivering OA to research articles, OA journals and OA archives or repositories.

The BOAI (Budapest Open Access Initiative) statement suggests two strategies for achieving Open Access:

- 1) Self-Archives and
- 2) Open Access Journals.

2.1 Self-Archiving or Open Access Archiving (OAA) or Institutional Repository (IR) or Digital Library(DL):

2.1.1 Concept of Institutional Repository:

An Institutional Repository is an online location for collecting, preserving, and disseminating — in digital form — the intellectual output of an institution, particularly a research institution.

For a university, this would include materials such as research journal articles, before (preprints) and after (post prints) undergoing peer review, and digital versions of theses and dissertations, but it might also include other digital assets generated by normal academic life, such as administrative documents, course notes, or learning objects.

According to Barbara Leslie Kirsop and Subbiah Arunachalam.³

Open Access Archives (OAAs) are electronic repositories that may include already-published articles (post-prints), pre-published articles (pre-prints), theses, manuals, teaching materials or other documents that the authors or their institutions wish to make publicly available without financial or other access barriers. The articles published in peer-reviewed journals, as they represent the main source of research results that largely remain kept behind subscription barriers. The primary goal of OAA is to maximise the accessibility of the research publications and their impact, as it is this that forms the basis for future scientific development.⁴

Self-archiving can be achieved in at least three ways:

A. Putting articles on author Web sites:

The some authors make Open Access to researchers, their articles, and other literature on web and offer free access.

B. Depositing articles in disciplinary archives:

A disciplinary archive provides access to e-prints for one scholarly discipline or multiple scholarly disciplines. The most famous disciplinary archives is arXiv, which covers physics, mathematics, non-linear science, computer science, and quantitative biology.

C. Depositing articles in institutional archives and repositories:

Institutional archives and repositories focus on the literature produced by a single institution. An institutional e-print archive may contain e-prints written by scholars from many departments, research centers, or other units, or, it may only contain the e-prints of a single unit. 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. DSpace at MIT is a notable example of an institutional repository (the DSpace project began in 2000).⁵

2.1.2 Objectives of IR or DL

The four main objectives for having an institutional repository are:

- * To create global visibility for an institution's scholarly research;
- * To collect content in a single location;
- * To provide open access to institutional research output by self-archiving it;
- * To store and preserve other institutional digital assets, including unpublished or otherwise easily lost ("grey") literature (e.g., theses or technical reports).⁶

2.1.3 Concept of DL or IR :

A digital library is a collection of information that is stored and accessed electronically. A conventional research library stores more than

books, and the digital library is the same. Almost every type of information can be represented in digital form, including text, pictures, musical works, computer programs, databases, models and designs, video programs, and compound works combining many types of information.

Digital libraries are described generally as systems providing users with access to large organized repositories of information. A simple definition of a digital library is 'a library consisting of digital materials and services. Digital materials are items that are stored, processed and transferred via digital (binary) devices and networks.' Digital library services are information services that are delivered digitally over computer networks.⁷

2.1.4 Steps for Creating Digital Library:

- * Selection of documents and scanning
- * Storage and Management
- * Search and Access
- * Distribution
- * Rights Management
- * Preservation

2.1.5 Open source software (OSS)

- * This permits users to use, change, and improve the software, and to Open source software (OSS) is defined as computer software for which the source code and certain other rights normally reserved for copyright holders are provided under a software license
- * redistribute it in modified or unmodified forms.
- * It is very often developed in a public, collaborative manner.
- * Open source software is the most prominent example of open source development and often compared to user-generated content.
- * The term *open source software* originated as part of a marketing campaign for free software.⁸

2.1.6. Open -Source Software for Institutional Repository or Digital Library:

There are many Open Source Institutional Repository or Digital Library Soft wares are **available** on the net, among few of them **are** mentioned below:

2.1.6.1. Archimede :

Developed by Laval University Library in Quebec City, Canada, the Archimede project was designed to accommodate electronic preprints and post-prints from the institution's faculty and research staff. The Archimede institutional repository system complements two system components previously released by Laval. The first manages the university's electronic theses and dissertations; the second provides a production platform for electronic journals and monographs.

2.1.6.2. ARNO:

The ARNO project—Academic Research in the Netherlands Online—has developed software to support the implementation of institutional repositories and link them to distributed repositories worldwide (as well as to the Dutch national information infrastructure). The project is funded by IWI (Dutch acronym for "Innovation in Scientific Information Supply"). Project participants include the University of Amsterdam, Tilburg University, and the University of Twente. Released for public use in December 2003, the ARNO system has been in use at the universities of Amsterdam, Maastricht, Rotterdam, Tilburg, and Twente.

2.1.6.3. CERN Document Server Software (CDSware):

The CERN Document Server Software (CDSware) was developed to support the CERN Document Server. The software is maintained and made publicly available by CERN (the European Organization for Nuclear Research) and supports electronic reprint servers, online library catalogs, and other web based document depository systems.

2.1.6.4. DSpace :

MIT's DSpace was expressly created as a digital repository to capture the intellectual output of multidisciplinary research organizations. MIT designed the system in collaboration with the Hewlett Packard Company between March 2000 and November 2002. Version 1.2 of the software was released in April 2004. The system is running as a production service at MIT, and a federation comprising large research institutions is in development for adopters worldwide. This design supports the participation of the schools, departments, research centers, and other units typical of a large research institution. DSpace is also focused on the problem of long term preservation

of deposited research material.

2.1.6.5. E-Prints:

The E-Prints software has the largest and most broadly distributed installed base of any of the repository software systems described here. Developed at the University of Southampton the first version of the system was publicly released in late 2000. The project was originally sponsored by CogPrints, but is now supported by JISC, as part of the Open Citation Project, and by NSF.

2.1.6.6. Fedora:

The Fedora digital object repository management system is based on the Flexible Extensible Digital Object and Repository Architecture (Fedora). The system is designed to be a foundation upon which full featured institutional repositories and other interoperable web based digital libraries can be built. Jointly developed by the University of Virginia and Cornell University, the system implements the Fedora architecture, adding utilities that facilitate repository management.

2.1.6.7. Greenstone Digital Library Software(GSDL) :

The Greenstone Digital Library Software (GSDL) is a top of the line and internationally renowned Open Source Software system for developing digital libraries, promoted by the New Zealand Digital Library project research group at the University of Waikato, led by Dr. Ian H. Witten, and is sponsored by the UNESCO.'

2.1.6.8. iTor :

iTor Tools and technologies for Open Repositories—was developed by the Innovative Technology Applied (ITA) section of Netherlands Institute for Scientific Information Services (Dutch acronym: NIWI). 4 iTor development concentrates on four areas: E-publishing; repositories; the content management system; and "collaboratories.

2.1.6.9. MyCoRe:

MyCoRe grew out of the MILESS Project of the University of Essen. The MyCoRe system is now being developed by a consortium of universities to provide a core bundle of software tools to support digital libraries and archiving solutions (or Content Repositories, hence "CoRe").

2.1.6.10 OPUS:

OPUS Online Publications of the University of Stuttgart was developed in 1998 by the University Library and the Computing Center of the University of Stuttgart. The goal of the original project was to provide a system by which faculty, students, and staff at the university could manage their electronic publications, including published and unpublished articles and theses and dissertations.

The initial development project, funded by the German Research Net and the German Federal Department of Higher Education, ended in October 1998. Ongoing development of OPUS is now funded by the University of Stuttgart. Main features for future development include digital signatures and multimedia documents.⁹

3. Open Access initiative in India :

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 research institutions, such as Indian Institute of Science (IISc.), Indian Institutes of Technology (IITs), Indian Statistical Institute (ISI), institutions under the Council of Scientific and Industrial Research (CSIR) and Indian Council of Medical Research (ICMR).¹⁰

For the Development of Open Access Movement, The National Knowledge Commission of India (NKC), constituted on 13th June 2005, is a high level advisory body to the Prime Minister of India, with a mandate to guide policy and direct reforms. NKC's overarching aim is to transform India into a vibrant knowledge-based society. The NKC's Working Group on Open Access and Open Educational Resources and Working Group on Libraries have strongly recommended open access to public-funded research literature and supported establishment of open courseware repositories for countrywide dissemination of quality courseware to many cross-sections

of people. If implemented, these recommendations will have far-reaching implications in the knowledge creation and dissemination cycle. The scholarly literature and lifelong learning materials produced by state-sponsored institutions would then be made accessible through open access channels such as national and institutional repositories. NKC also recommended creation of national knowledge portals for basic needs/ key sectors such as water, energy, environment, education, food, health, agriculture etc.

NKC Working Group on Open Access and Open Educational Resources - Recommends

“Open access material stimulates research and helps students, teachers and researchers across the world. Therefore at a policy level, all research articles published by Indian authors receiving substantial government or public funding must be made available under Open Access and should be archived in the standard OA format at least on his/her website. As a next step, a national academic OA portal should be developed. The government should allocate resources to increase the current digitization efforts of books and periodicals which are outside copyright protection. Separate funding should be allocated to develop a new high quality OCR software package so that new and old fonts in many different Indian languages can be converted into ISCI/ASCI code and OA portals and servers could be upgraded regularly. Appropriate financial resources should be earmarked for these endeavours. This will also facilitate machine translation of these valuable resources.”¹¹

4 Digital Library Initiatives in India:

In India, some institutions, like Indian Institute of Science; Indian Institute of Management, Kozhikode; Indian Statistical Institute, Bangalore; Indian Institute of Technology, Delhi; National Institute of Technology, Rourkela; National Aerospace Laboratories, Bangalore; National Chemical Laboratory, Pune; Information and Library Network (INFLIBNET), Ahmedabad; National Institute of Oceanography, Goa; Raman Research Institute, Bangalore; etc. have established open access institutional repositories (IRs) that disseminate research outputs of respective institution.

Another band of digital repositories also exists in India that store

and provide access to subject specific collections of documents. These repositories accept scholarly publications from any professional or researcher who belongs to the respective subject. Librarian's Digital Library (LDL) of Documentation Research and Training Centre (DRTC), Bangalore is an example of subject-specific repository for the library and information professionals. Another subject-specific repository established in India is OpenMed@NIC, maintained by National Informatics Centre, New Delhi. OpenMed@NIC stores and provides access to biomedical literature. Other kind of digital repositories existing in India stores and provides access to document type specific 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. (12) As per the UGC's direction INFLIBNET has started two IR 'ShodhGang' for PHD and MPHIL Thesis and 'Gangotri' for Synopsys of PHD and MPHIL. It is compulsory to the all the universities to submit one digital copy on CD of PHD and MPHIL thesis. IGNOU also offers Course material including Video lectures of various subject free on the portal <www.ignou.ac.in> under eGyanKosh <http://www.egyankosh.ac.in/> which is a National Digital Repository to store, index, preserve, distribute and share the digital learning resources.

Some Examples of Digital Library Initiative:

1. The Digital Library of India Site (www.dli.gov.in/).
2. Rashtriya Sanskrit Sansthan <www.sanskrit.nic.in> free E-books
3. Indian Institute of Information Technology, Bangalore (IIIT-B) <http://www.iiitb.ac.in/digital_library.htm>
4. Indian Institute of Information Technology, Hyderabad (IIIT-H) <<http://www.iiit.net/infrastructure.htm>>
5. Indian Institute of Technology. Delhi <<http://www.iitd.ernet.in/acad/library/project.html>>
6. Indian National Science Academy (INSA)
7. Nalanda (Network of Automated Library and Archives) <<http://www.nalanda.nitc.ac.in/>>

8. Documentation Research and Training Centre (DRTC)
 9. 1. Librarians' Digital Library (LDL) <<https://drtc.isibang.ac.in/>>
2. Search Digital Libraries (SDL) <<http://drtc.isibang.ac.in/sd>>
 10. Indian Academy of Sciences (IAS)
 11. Medind@nic: Biomedical Journals. Indian MEDLARS Centre. <www.ias.ac.in/pubs/journals/>
 12. National Informatics Centre <<http://medind.nic.in/>>
 13. Medknow Publications. <www.medknow.com/journals.asp>
 14. IndianJournals.com. <<http://www.indianjournals.com/>>
 15. Kamla-Raj Enterprises. <www.krepublishers.com/KRE-New-J/>
 16. CSIR Explorations <<http://csirexplorations.com/>>
 17. NCSI, Indian Institute of Science, E-Prints DL .
5. **Conclusion:**

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, ETD etc.. In India, some other related initiatives also make 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 literatures available in the open access journals and archives. But still in India the Universities and College libraries are far away from this concept and few institutions are provided the IR or DL facilities. The Librarian is the key person in the organization and need to get training to develop the Institution repository or Digital Library for in house literature of their respective institution with open access software available free of cost on the net world wide to serve their end user.

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