
The Institutional Repositories : An Alternative Model for Scholarly Publishing

Ramesh C Gaur Usha Majoo Munshi T A V Murthy

Abstract

Indian University Libraries are constantly grappling with the issue of cost inflation of library resources (cost of library materials have out spaced cost of living) coupled with resource explosion. Some alternate solutions may have emerged in form of rationalization of periodicals, resource sharing, site licences and now consortia. Importances of these concerns have been clearly defined in the main objectives of the INFLIBNET. However, the fundamental problem remains. The paper highlights how by using the Internet / Intranet revolution, this problem can be minimized. The focus of the paper is on developing Institutional Repositories - one of the prime issues that is of utmost importance keeping in view multifaceted factors (information explosion; cost inflation and ICT) that have had immense impact on the existing research cycle. The issues concerning public / open access to scholarly articles in form of Institutional Repositories (IR) are also discussed here in this paper.

Keywords : Institutional Repositories; Scholarly Publishing, Institutional Archives

0. Introduction

The information revolution leads to the 'flood of publications' or 'information glut'. Users have more journals to read but prices have increased faster than library budget, so, it is becoming difficult for the libraries to even maintain their current subscriptions. To balance budgets, libraries have been forced to cancel some journal subscriptions. Scholarly communications are must for any library. Even the most resourceful libraries cannot subscribe to even substantial part of the requisite resources that its users require, leave alone all the core information resources in the desired area/s of interest . Due to various reasons most of the libraries in countries like India have adopted hybrid model for the subscription of information resources i.e. print + online and in such cases many publishers charge extra for online access. Site licensees and consortia deals are helpful to some limited libraries. The issues concerning archival access are always cause of concern to all of us (2).

In the 1990's, a broad movement to enhance public access to scholarly journal articles through the use of "pre-print" servers began to grow. Essentially, the idea of these servers was that authors would deposit their pre-prints (not yet published work) into such servers, providing readers worldwide with a quick way of obtaining access to research results, without needing paid subscriptions to the source journals. These types of servers also referred to as "repositories" or "archives", began as informal vehicles for the disseminating of preliminary research results and non-peer reviewed literature (3). One of the pioneer preprint efforts was from Paul Ginsparg in 1991 at the Los Alamos National research Laboratory in new Mexico (1) which is now known as arXiv. However, in the last decade, we have seen the rapid evolution of these servers into increasingly important mediums for the dissemination of research results in certain fields. This model of disseminating scholarly work is broadly used in the physical sciences, but is also becoming more widely known in many other fields, such as health sciences, and the humanities and social sciences.

To cope up with such a situation "institutional repositories or institutional archives- as one of the potentially major component in evolving a digital collection of scholarly communication has been emerged. At the

same time World Wide Web has opened up a new way for individual scientists and their institutions to preserve and leverage their intellectual assets directly and freely online. So, Institutional Repositories can provide an immediate and valuable complement to the existing scholarly model, and at the same time help institutions in developing their own resource base and subsequently new areas of resource sharing with other institutions under the open archive initiatives. In this way, e-print archives, open archives, self archiving and institutional repositories can complement each other. The decrease in the price of information technology particularly networking technology and new innovations in WWW had helped emergence of institutional repositories. Institutional repositories adopt the same open-access and interoperable framework as pre-print archives, but for rather than being discipline-based, represent the wide-range of research output produced by one institution.

1. IR : An Alternative Model for Scholarly Publishing

The basic model for scholarly publishing has remained unchanged for almost 300 years. From the printing revolution to information revolution, readers have been assured of quality information earlier via print and now with print + online scholarly communications. However, the scenario has changed now so far as user information needs (in terms of information seeking patterns of users); multifaceted ways of accessing information; and availability of information in multimedia forms is concerned. There has been growing concern about the issues related to regular increase in the cost of the information. The prohibitive costs have been hampering research process somehow that needed urgent attention. At the same time Internet has opened new ways and means of information storage and dissemination. In such a situation, the readers have been facilitated now with more options and choices. The open archive initiatives have given both users and librarians to change fundamentally the way, the information is being disseminated. The culmination of information explosion; inflation and ICT fervor has changed the entire landscape of research cycle.

Can IR be an alternative model for scholarly publishing? The present paper presents an overview of IR and worldwide IR initiatives to find out answer to this question (2). The growing popularity of electronic publishing / digital publishing and the Internet / Intranet as a means of dissemination has opened up possibilities of an alternative model for scholarly publishing.

2. What is IR ?

“Institutional Repositories are digital archives that capture, organize, preserve and disseminate the intellectual assets of a single institution or a group of institutions by forming a global system of distributed and interoperable digital libraries. The basic objective of institutional Repositories is to promote wider use of intellectual output of particular institution or a group of institution. An institutional archive should follow international technical standard to ensure the open access to its contents. .”

3. IR - key components

There are several key components of IR system, some of these have been listed below:

3.1 Generators / users of information resources (Authors)

Authors are both generators as well use users of information. They represent the most important component of an IR system. They need to support IR initiatives by way of self-archiving, refereeing, reading, and citing articles. They can have great influence on publishers to come out with an alternate model to support IR initiatives. Without their cooperation IR initiatives in true sense are not possible.

3.2 Information providers and IR designers (Librarians and Computer Scientists).

The other most important component of IR system is being represented by Librarians and Computer scientists who also have a great role to play if successful endeavours with regard to generation and maintenance of IR systems are to be made and executed. Both of these categories are hence by and large responsible for design and development of efficient and effective IR systems. Librarians have bigger role as a designer as well as service providers. A librarian is the focal point of the IR system. Other than the establishment of the IR, they need to publicize and promote the IR initiatives.

3.3 Infrastructure

The essential infrastructure support in terms of software and hardware requirements, Internet and Intranet connectivity, and various other technological tools to support development of an IR system are also very crucial for the successful establishment of IR

3.4 Funding /OAI Societies / Political support.

Funding, and support from professional as well as from political boundaries are also necessary for the success of IR initiatives.

3.5 Contents in IR:

Institutional Repositories may contain a wide range of intellectual assets such as preprints, working papers, articles, course material, handouts, theses and dissertations, monographs, institute journals, standards, reports, proceedings and notes and the like. The resources could be a text document, data or multimedia.

4. IR Design architecture

IR may have multi-tier design architecture. IR architecture has been divided into three major groups;

- Operational architecture- It is an information management system that represents system, services, and data management layers.
- Technical architecture-It break downs operational architecture in to functional components and capabilities.
- Systems architecture - It shows the technology enablers and their possible inter-relationships.

Basically an digital library (DL) design architecture has the following key components: general to specific communities, archives or repositories to serve the needs of the communities, services designed for communities, and scalability & interoperability to provide seamless access to the communities. Design of individual services, user interface, display formats, indexing styles, digital preservation, data federation, service federation, web services, security and uniform standards are some other important issues need attention of the developers in relation to IR.

The IR architecture needs to address all above issues. It may be worthwhile to mention here that in DL architecture, communities can have access to the digital library services locally via Intranet and globally via Internet.

5. Developing Institutional Archive - Key Steps

Some important steps involved in developing an Institutional Archive are:

- Registration
- Certification
- Awareness
- Digital preservation policy
- Archiving
- Self- archiving
- Open archives Initiative

6. Benefits

Institutional Repositories are beneficial to all researchers, institutions and entire research community. Its other major benefits include - cost savings, avoids duplication of efforts, broaden communication process, reduction in time in announcing the findings, more user audience and above all preserving the information assets for posterity. Institutional Repositories may help an institution in improving its prestige as well as visibility worldwide. As such in the process may lead to additional revenue generation. These Repositories are more beneficial to developing world as it apparently obviates many hurdles such as traditional journals are having page limits, so it can not accept more than a limited number of articles but institutional Repositories do not have such binding, they can accept as many articles to be stored. This may help in publishing the findings of the entire scientific community from developing countries. Institutional Repositories can help in bridging the digital divide and also may help in enriching the education, facilitate bi-directional (developed to developing and vice-versa) flow of information that is happening at a very miniscule level at the moment (share learning among rich and poor nations), thereby may help in improving the status of developing world.

7. Problems

The scientific community is currently facing somewhat helpless situation due to poor bandwidth and inadequacy of generation of digital resources, hence poor visibility. Lack of awareness and non-availability of telecommunications infrastructure particularly in developing world are two major problems in the way of institutional Repositories. Review of the contents is another problem as it is difficult to have control over the quality of the content of digital assets archived in an institutional archive.

8. International Repositories – Successful Initiatives

Following are a few endeavours that are up and running successfully

8.1 arXiv: <http://www.arxiv.org>

ArXiv is an e-print service in the fields of physics, mathematics, non-linear science, computer science, and quantitative biology. The contents of arXiv conform to Cornell University academic standards. arXiv is owned, operated and funded by Cornell University, a private not-for-profit educational institution. ArXiv is also partially funded by the National Science Foundation.

8.2 CogPrints <http://cogprints.ecs.soton.ac.uk/>

CogPrints, an electronic archive for self-archive papers in any area of Psychology, neuroscience, and Linguistics, and many areas of Computer Science (e.g., artificial intelligence, robotics, vision, learning, speech, neural networks), Philosophy (e.g., mind, language, knowledge, science, logic), Biology (e.g., ethology, behavioral ecology, sociobiology, behaviour genetics, evolutionary theory), Medicine (e.g., Psychiatry, Neurology, human genetics, Imaging), Anthropology (e.g., primatology, cognitive ethnology, archeology, paleontology), as well as any other portions of the physical, social and mathematical sciences that are pertinent to the study of cognition.

8.3 RePEc <http://repec.org/>

RePEc (Research Papers in Economics) is a collaborative effort of over 100 volunteers in 41 countries to enhance the dissemination of research in economics. The heart of the project is a decentralized database of working papers, journal articles and software components. Open ended initiative, hence any institution is welcome to join in contributing its research materials. All RePEc material is freely available.

8.4 Dspace <https://dspace.mit.edu/index.jsp>

DSpace is an open source software platform that enables institutions to:

- capture and describe digital works using a submission workflow module
- distribute an institution's digital works over the web through a search and retrieval system
- preserve digital works over the long term

8.5 E-prints Archive www.eprints.org

This e-print archive is dedicated to opening access to the refereed research literature online through author/institution self-archiving

8.6 ND LTD <http://www.ndltd.org/>

The concept of electronic theses and dissertations (ETDs) was first openly discussed at a 1987 meeting in Ann Arbor arranged by UMI, and attended by representatives of Virginia Tech (Edward Fox from Computer Science and Susan Bright from the Computing Center), University of Michigan, SoftQuad, and ArborText. As followup, Virginia Tech funded development of the first SGML Document Type Definition (DTD) for this purpose, by Yuri Rubinski of SoftQuad.

Virginia Tech's Dean Gary Hooper agreed to finance further development in 1991. Ed Fox and John Eaton (Dean of the Graduate School) have collaborated on this project since that time, investigating problems associated with production, archiving and access, initially with a local faculty committee. Since 1992 they have worked with the Coalition for Networked Information (CNI), the Council of Graduate Schools (CGS), UMI and other interested organizations, helping run a series of design and discussion meetings. Additionally, the University Library's Scholarly Communications Project developed the procedures and systems for processing, archiving, and providing public access to Virginia Tech's graduate research works.

8.7 Universal Digital Library <http://disc.iisc.ernet.in/unidiglib.html>

The aim of the project is to digitize around a million books in the next three years. This joint initiative is planned to synergetically capitalise on the availability of the state-of-the-art of hardware and software in

the US for digitizing, storing and accessing of information and the quality manpower available in India. This would act as a forerunner for many such initiatives with other countries, particularly in China and Korea and would culminate in the grandiose vision of digitizing all the formal knowledge and make available in a location and time independent way for the benefit of the mankind.

8.8 BioMed Central <http://www.biomedcentral.com/>

BioMed Central is an independent publishing house committed to providing immediate free access to peer-reviewed biomedical research. All the original research articles in journals published by BioMed Central are immediately and permanently available online without charge or any other barriers to access. This commitment is based on the view that open access to research is central to rapid and efficient progress in science and that subscription-based access to research is hindering rather than helping scientific communication.

8.9 SPARC <http://www.arl.org/sparc/core/index.asp?page=a0>

SPARC is an alliance of universities, research libraries, and organizations built as a constructive response to market dysfunctions in the scholarly communication system. These dysfunctions have reduced dissemination of scholarship and crippled libraries. SPARC serves as a catalyst for action, helping to create systems that expand information dissemination and use in a networked digital environment while responding to the needs of scholars and academe

9. National Archives

9.1 USA

- National Science Digital Library <http://nsdl.org>
- eScholarship: University of California <http://repositories.cdlib.org>
- <http://eprints.rclis.org/> E-prints in library and Information Science
- <http://www.prism.cornell.edu/> Cornell University Project
- <http://dscholarship.lib.fsu.edu/> Florida State University D-Scholarship Repository
- <http://www.lib.ohio-state.edu/KBinfo/> Ohio State University Knowledge Bank
- FSU - dScholarship - dscholarship.org
- CDL - eScholarship
- Cornell University - PRISM Project
- Ohio State University Knowledgebank
- University of Virginia - Fedora Project
- Va. Tech - Scholarly Communications Project

9.2 India

Indian National Science Academy (INSA) – Journals (www.insa.ac.in)

All the academic journals of INSA have been converted from print to digital. Digitization of the journals right from 1st volume completed. Complete archive of all the journals are web accessible. Access to INSA journals is free and unrestricted. Perhaps first of its kind initiative taken by a Library in India for creating a digital resource base and promoting and supporting dissemination and access to scientific information in online environment.

Indian Academy of Sciences (IAS)-Journals (<http://www.ias.ac.in>). Digitization of journals from 1st issue is underway. All journals are web accessible.

IndMed Database (<http://indmed.delhi.nic.in> – (now called MedInd) It is the first web based Indian biomedical database covering 75 Indian Journals. It is being initiated by Indian MEDLARS Centre, New Delhi.

National Collection of Industrial Micro-organisms (NCIM) <http://www.ncl-india.org/ncim>

National Centre of Biodiversity Informatics <http://www.ncbi.org.in>

NISCAIR <http://www.niscair.res.in>

eprints@iisc <http://eprints.iisc.ernet.in> E-prints archive of Indian Institute of Science, Bangalore. It contains IISc. research papers, preprints, book chapters, technical reports, unpublished findings, conference papers, magazine articles etc.

The Documentation Research and Training Center (DRTC) (<http://drtc.isibang.ac.in>) : It is a digital library for Library and Information Science. The Documentation Research and Training Center, Indian Statistical Institute (ISI), is a premier research institute, founded by Prof. S.R. Ranganathan. The DRTC digital repository contains a specialist collection of Library and Information Science resources.

9.3 UK

SHERPA <http://www.sherpa.ac.uk/>

SHERPA aims to investigate issues to do with the future of scholarly communication and publishing. In particular, it is initiating the development of openly accessible institutional digital repositories of research output in a number of research universities. These so-called 'e-print archives' will contain papers by researchers from the participating institutions.

9.4 Netherland

DARE <http://nhscrd.york.ac.uk/darehp.htm>

At its inception in 1994 DARE was known as a database of quality assessed reviews. Staff at NHS CRD identified potential systematic reviews and assessed them against a set of inclusion criteria that sought to select only those of high methodological quality. Since that date, the science of systematic reviews has developed considerably. The recent changes in the inclusion criteria for DARE reflect the improved quality of reviews published today. While it would be useful to refer to DARE as a database of high quality reviews, the staff of NHS CRD do not think this entirely appropriate, as some of the older reviews on DARE, while of the highest quality at the time, would not be considered so now. Therefore we consider it a database of quality assessed reviews.

9.5 Africa

INASP <http://www.inasp.org.uk/>

INASP is a cooperative network of partners. Its mission is to enhance the flow of information within and between countries, especially those with less developed systems of publication and dissemination.

INASP was established in 1992 by the International Council for Science (ICSU), as a programme of the Committee for the Dissemination of Scientific Information (CDSI).

9.6 Canada

CARL institutional repositories.

9.7 Australia

E-print Repositories: Australian National University <http://eprints.anu.edu.au>

10. Open Source Institutional Repositories Software

The most important basic need for the development of an OAI compliant IR is Software. Given below are some of the open source software's available for the development of an IR:

Dspace <http://cdsware.cern.ch/www.dspace.org>

Eprints <http://cdsware.cern.ch/www.eprints.org>

i-ToR <http://cdsware.cern.ch/www.i-tor.org/en/toon>

MyCoRe <http://cdsware.cern.ch/www.mycore.de/engl/index.html>

CDSWare <http://cdsware.cern.ch/>

FEDORA <http://www.fedora.info/>

For more details on above a guide to Institutional Repository software is available at <http://www.soros.org/openaccess/software/> .

11. IR and Developing Countries

The key beneficiaries to the IR initiatives are researchers from the developing world. IR gives them an opportunity to access, inform as well as publish their contributions without much delay and in process they can also participate in global research initiatives. Therefore, the essence of IR is to facilitate researchers, academic community, in fact all those who are associated with publishing research results, academic communications, finding out what is going on in the said area/s and stay tuned.

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3. WHAT IS AN INSTITUTIONAL REPOSITORY? In electronic format: http://www.ucalgary.ca/library/dspace/what_is.html

About Authors

Dr. Ramesh C. Gaur is Librarian at Tata Institute of Fundamental Research (TIFR), Mumbai – 400 005, India and holds B Sc, MLISc, PGDCA and Ph.D. Currently he is visiting Virginia Tech., USA, under Fullbright Fellowship. He worked with Eicher Research Centre, Faridabad, Central Road Research Institute, New Delhi, Brisk Securities Ltd., RIS, New Delhi and IMT, Ghaziabad. He has contributed two books and over 30 papers. He has organized MANLIBNET Convention and UPLA Seminar and member of all Library Associations. His interests range from web designing to training programmes on IT in the library and information field.

E-mails: rcgaur@tifr.res.in, ramesh_c_gaur@hotmail.com



Dr. Usha Majoo Munshi is Head , Informatics at Indian National Science Academy, New Delhi, India and holds B Sc, MLISc, MA in Public Administration and Ph.D. She also worked with INSDOC, New Delhi and has over 100 research publications and a few books to her credit. She is the Recipient of Raizada Memorial Award 1994 for Young Information Scientist of SIS, SIS Fellowship, ASSIST International Best Paper Award, SATKAL Best Librarian Award 2002 and Full-bright Scholarship in 1996-97 and visited University of Maryland, USA. She was one of the members for 4 Nation delegation to Germany pertaining to LIS education and has been a Reviewer for the Malaysian Journal of Library & Information Science. She is currently acting as a member of various national and international committees in the area of information science and technology. Her research interests include information technology with special reference to human computer interaction and Bibliometrics.

E-mail: umunshi@homail.com , insa@giasdl01.vsnl.net.in



Dr. T.A.V. Murthy is Director of INFLIBNET Centre, Ahmedabad-380009, India and holds B Sc, M L I Sc, M S L S (USA) and Ph.D. He is President and Fellow of SIS-India, Hon. Director of E.M.R.C., Gujarat University and Member Secretary of ADINET, Ahmedabad. He carries with him a rich experience and expertise of having worked in managerial level at a number of libraries in many prestigious institutions in India including National Library, IGNC, IARI, Univ of Hyderabad, ASC, CIEFL etc and Catholic Univ and Case western Reserve Univ in USA. He has been associated with number of universities and has guided number of Ph.Ds and actively associated with the national and international professional associations, expert committees and has published good number of research papers. He visited several countries and organized several national and international conferences and programmes.

E-mail : tav@inlibnet.ac.in