IMPACT OF INSTITUTIONAL REPOSITORIES (IRS) TO IMPROVE EDUCATIONAL RESEARCH AND SCHOLARLY COMMUNICATION WITH SPECIAL REFERENCE TO BANGLADESH AND INDIA

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ABSTRACT

The prime aim of this paper is to discuss the roles of IR to improve higher education and scholarly communication. The other objectives are to find out the importance and impact of IR in higher education, to give an idea about the present status of IR in Bangladesh and India, the challenges for sharing higher education repositories. The study reported that IR can play a vital role in 21st century’s higher education and scholarly communication in developing countries. This study also provides some recommendations and a model to develop a better IR in educational institutions.

KEYWORDS: Institutional Repositories, Scholarly communication, Higher Education, Bangladesh.

INTRODUCTION

Over the last decade, higher education around the world is facing a number of challenges, such as adopting new technologies, improving the quality of learning and teaching, curriculum design, student employability, funding etc. To efficiently operate and to survive in this globalization era, higher education institutions need to respond those challenges in competent way. So, in the present age, academic institutions including universities have increasingly recognized that an institutional repository (IR) is an essential infrastructure of higher level education. It argued that the institutional repository is a very powerful idea that can serve as an engine of change for institutions of higher education. IR, which is dynamic, demonstrably successful are arguably currently the major standard of higher education, irrespective of geographical and resource context. Institutional repositories (IRs) have since become a global phenomenon; they are now recognized on all continents, with the largest repositories being found in Europe, North and South America, Japan, India and Australasia. Curiosity in establishing and promoting repositories is likely to show continued growth, particularly as academic staff increase their online presence and adapt their work patterns to the new Web 2.0 tools such as blogs, wikis, and virtual communities (Cullen and Chawner, 2009). Lynch in 2003 reported that the intellectual life and scholarship of universities will increasingly be represented, documented, and shared in digital form. Institutional repositories are one of the tools that make this possible.

EARLY HISTORY OF IR

IRs began at the same time as the World Wide Web itself. The first online repository, centering on theoretical physics, was established in 1999 by physicist Paul Ginsparg at the Los Alamos National Laboratory in New Mexico and known as arXiv—pronounced archive. Its current home is Cornell University in Ithaca, New York, where it has been since 2001. The origin of the notion of an “institutional repository” is twofold:
i. Institutional repositories are partly linked to the notion of digital interoperability, which is in turn linked to the Open Archives Initiative (OAI) and its Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). The OAI in turn had its roots in the notion of a "Universal Preprint Service", since superseded by the open access movement.

ii. Institutional repositories are partly linked to the notion of a digital library - i.e., collecting, housing, classifying, cataloguing, curating, preserving, and providing access to digital content, analogous with the library's conventional function of collecting, housing classifying, and curating, preserving and providing access to analog content.

**OBJECTIVES OF THE STUDY**

The main objective of this study is to discuss the roles of IR in enhancing higher education and scholarly communication in Bangladesh. The other objectives are

i. To show the present scenario of IR in Bangladesh and India.

ii. To find out the impact of IR and why IR is important in higher education?

iii. To show the relation of IRS with educational research and scholarly communication

iv. To propose a model for development of IR in Bangladesh.

v. To find out the challenges and to provide some recommendations for improve IRS in higher education

**METHODOLOGY**

This study is based on an inclusive review of literature. Data collected from secondary sources of information. Secondary data also collected from different organizations, articles, newspapers, websites and other existing resources. This is the result of meticulous literature search, not only of published materials but also of all unpublished sources which are available.

**Growth of IRS worldwide**

This graph shows the changing size of the OpenDOAR Database over time. The shape of the chart in 2006 reflects the work of OpenDOAR rather than the growth of the number of actual repositories. A backlog of new records built up while the database was being redeveloped during mid-2006, and clearing this backlog created the step in the graph. The chart better represents the true growth in the number of repositories from 2007 onwards. The database shrank slightly at the beginning of 2012 as a result of quality control exercise that revealed a number of non-functioning repositories.

**Figure 1: Growth of IRS worldwide**
Benefits of IR in higher education

According to Pickton & Barwick (2006) the benefits of repositories to institutions and individuals are numerous and can be grouped into the following categories.

Specific to the educational institutions, an IR offers the followings:

i. A high profile IR may be used to support marketing activities to attract high quality staff, students and funding.

ii. Centralization and storage of all types of institutional output, including unpublished literature.

iii. Links may be made with the virtual teaching environment and library catalogues.

iv. The compilation of an ‘Institutional CV’ and individual online dossiers linked to the full text of articles becomes possible.

v. Ability to keep track of and analyses research performance.

vi. Breaking down of publisher’s costs and permissions barriers.

vii. Alleviation of requirement to trust publishers to maintain information in the long term, without any commercial benefit for the authors.

viii. Create IR policies and procedures in the institutions and also participate in the creation of IR metadata.

ix. Promotion of a philosophy of wider communication and train the users in IR and help to searching the content.

Scholarly communication

Scholarly communication is a term used to describe the process of academics, scholars, and researchers sharing and publishing their research findings so that they are available to the wider academic community. In the past when print was the only form of publication, scholars would assume that the products of their work would live long lives on library shelves as books and journal articles. In today’s publishing environment where electronic publications are proliferating, as electronic resources for scholarship proliferate, more and more scholars turn to their computers rather than to print sources to conduct their research. In an effort to address their concerns, several digital preservation projects have been developed in recent years. Technological change is undermining the traditional functions and business of publishing and is giving individual scholars new choices: to publish in traditional print or in electronic journals. Today, the libraries are playing a central role in distributing both print and online resources, but the networked digital environment has enabled the creation of many new kinds of works that are accessible to end users directly.

Relation of IRs with educational research and scholarly communication

The potential of IRs to help to foster change within the academy is noteworthy (McCord 2003). Lynch in 2003 said that IRs as essential infrastructure for modern scholarship. He also argues that “the development of institutional repositories emerged as a new strategy that allows universities to apply serious, systematic leverage to accelerate changes taking place in scholarship and scholarly communication”. Markey et al (2007) mentioned that, “a considerable portion of the scholarly record is born digital, and some scholarship is produced in digital formats that have no physical, in-the-hand counterparts. The proliferation of digital scholarship raises serious and pressing issues about how to organize, access, and preserve it in perpetuity. The response of academic institutions has been to build and deploy institutional repositories (IRs) to manage the digital scholarship their learning communities produce”. All these definitions of an IR agree that it is an enabling component of digital scholarship and this paper works on the premise that IR is currently a cornerstone of scholarly communication and an important tool to manage institutional intellectual output. This seems to suggest that the success of educational research and scholarly communication can at least partially or fully depend on the success of IRs (see Figure 2).

Impact of IR

As digital publishing technologies continue to evolve, forcing a basic change in the structure of scholarly communication, everybody connected with the process will be affected such as:

i. Librarians, faculty members, students, research funding agencies, and commercial and non-commercial publishers.

ii. The character and scope which IRs impacts the major stakeholders suggest where resistance might be encountered and the manner in which such impediments might be overcome.

iii. Likely, the clarity with which proponents communicate the benefits of IRs to key participants will have a direct impact on the success of individual implementations.
Figure 2: Relation of IR with educational research and scholarly communication

Proportion of IRs by Continent Worldwide

This chart is based on the number of organisations that host repositories in each Continent. Some organisations have two or more repositories - over 20 in some cases - but in this chart, each organization only counts once.

Proportion of Repository Organisations by Continent Worldwide

- Europe (1026 = 45%)
- Asia (473 = 21%)
- North America (412 = 18%)
- South America (199 = 9%)
- Africa (92 = 4%)
- Australasia (50 = 3%)
- Caribbean (13 = 1%)
- Central America (13 = 1%)

Total = 2289 organisations

OpenDOAR 12 Nov 2014

Figure 3: Proportion of IR worldwide
Present scenario of IRs in Bangladesh

The development of open access institutional repositories has been very remarkable in developed countries as well as in some developing countries like Brazil, India and South Africa. The OpenDOAR: (Directory of Open Access Repositories) is the authoritative directory of institutional open access repositories. Each repository of OpenDOAR is visited by project staff to see the information that is recorded there. OpenDOAR has listed over 2600 repositories all over the world. A growing number of countries are implementing repositories in their research institution all over the world where Bangladesh is included as well. In developing countries like Bangladesh, it has been seen as an unprecedented opportunity to provide equality of access to essential research information and to raising awareness of national research .In Bangladesh BRAC University is the first institution of the country which established a digital repository that was funded by the INASP (International Network for the Availability of Scientific Publications). OpenDOAR listed eight institutional repositories for Bangladesh.

Present scenario of IRs in India

In India there are 42 repositories which are listed by OpenDOAR and run by various types of organizations such as universities, institutes, research organizations, government and non-government organizations, etc (Thorat 2013). These repositories contain various types of items, with various types of dissemination policies. The repositories have been studied considering repository software used, repository type, operational status of the repository, Content types in repository, languages, subject area, meta-data reuse policy, recorded (full-text) data reuse policy, recorded content policy, submission policy, preservation policy, year wise growth in number of repositories etc.

Challenges of IR in higher education

Even though the plentiful returns of an IR, there are inferences and prospective challenges to its achievement. So, this portion presents a brief summary of the IRs that relates to the higher education challenges.

i. Inadequate Funding

Lack of funding is a major problem experienced by developing country institutions in their effort to establish digital repositories. The state of ICT infrastructure in academic and research institutions in developing countries is so low to sustain the development of institutional repositories. Hence a viable digital repository project will first require serious upgrading of the current state of ICT facilities in many academic and research institutions in Nigeria.

ii. Inadequate advocacy

Advocacy is another obstacle to development of institutional repository. One of the best ways to promote the development of open access institutional repository in developing countries is through advocacy. For such advocacy to be really effective, it must be undertaken by the stakeholders in the region. This stakeholder includes lecturers, researchers, librarian as well as students. Effective advocacy presupposes that the advocates or stakeholders are very familiar with the concept. Unfortunately, knowledge of open access institutional repository is very low among the major stakeholders in the developing region.

iii. Awareness of open access publishing

Ignorance or lack of knowledge of open access institutional repository seems to be one major issue to the development of open access institutional repository in developing countries. It is only when this ignorance is tackled that any meaningful progress can be made.

iv. Cost

The initial financial cost for an open source software adopted by most institutions for creating IRs is not high but the recurrent costs, especially staff costs (e.g. time spent drafting policies, developing guidelines, publicizing, training, supporting users and creating metadata, specialist IT consultancy) may be significant. This is further discussed below.

v. Difficulties in generating content

A successful IR depends on the willingness of authors to deposit their work voluntarily and there may be local barriers and hindrances to be overcome. There are acknowledged difficulties in generating content, especially at the beginning. Unless the value of an IR can be demonstrated quickly, the organization's long-term commitment to the project may begin to wane. The best way to prove the enduring value of the IR and to ensure its long-term survival is to quickly populate it.

vi. Sustaining support and commitment

Far too often, it is difficult to sustain continuous support and commitment from the management and academic staff. Lynch (2003) has succinctly described this obstacle: “Stewardship is easy and inexpensive to claim; it is expensive and difficult to honour, and perhaps it will prove to be all too easy to later abdicate”. There is a need for institutions to think seriously before launching institutional repository program as it may disintegrate rapidly if not properly managed.

vii. Rights management issues

Sometimes researchers are apprehensive about infringing publishers' copyright and lack adequate awareness about their own intellectual property rights. They may be uncertain about making their work available online before it is published by a traditional publisher.
viii. Working culture issues

Contributing content to user-generated or ‘self-service’ sites is time consuming; and time is something which academics often lack. They may be willing to contribute content but reluctant to do it themselves. This calls for mediated deposits service for them.

ix. Policy issues

Experiences suggest that an IR will only function to its capacity when a mandate is in place to populate it but clearly researchers can react negatively to any suggestion of compulsion. Lynch (2003) has cautioned that an IR should not become a tool for enforcing administrative control over academic work.

x. Lack of incentives

In the absence of any incentive academics feel reluctant to provide even bibliographic details of their scholarly output especially when they know that incentives are available in other institutions.

Recommendations for improve IRs in higher education

Based on the findings, the following recommendations have been made for progress user awareness and use of institutional repositories for enhancing educational research which are given below:

i. Implementation of policy

Institutions of higher education should implement policies to enable establishment of IRs in every country. Policies such as the Intellectual Property Management, Institutional Repository, and the Research and Innovations should be enacted. The IR policy in particular should address issues such as copyright; self-archiving; submission of content, withdrawal policies; and types of materials to be deposited.

ii. Subject or keyword metadata field

In the subject or keyword metadata field, it does not use controlled vocabulary like library of congress subject heading (LCSH), Sears list or thesaurus and that is likely going to affect the efficient retrieval.

iii. Popular interface

Popular interface need to upload in the help section, so the local version of documentation should be included in the help section to facilitate the local user community.

iv. Browsing facility

The institutional repository should also include the browsing facility by ‘type of documents’.

v. Management Role

The concept of IRs in institutional libraries needs to be given emphasis, by the management. If the institutional repositories are established and developed, it will reduce the burden of main libraries.

vi. Implement the social networking tools

It is also suggested to implement the social networking and web 2.0 tools such as twitter, facebook, google+, and RSS feed to keep the user community update about the activities of university repository.

vii. Assistance in the deposit process

Assistance in the deposit process, either technical assistance or indeed doing the work for authors; where possible information about publications should be gathered from aggregate sources such as open access journals.

viii. Education and Publicity

Education and Publicity about their tailored to the individual authors research discipline, concerns, and technical savvy. This education could include information about the increased impact of open access papers and any search engine harvesting of the IR

ix. Capacity building

Capacity building is crucial for equipping librarians with digital skills required to implement IRs. Educational institutions can achieve this through its Staff Exchange programme whereby staff attachments are made at institutions which have already established IRs.

x. FAQ section

Similarly a FAQ section, most viewed items, recently added items are some of the features worthy to be implemented in university repository.

Proposed model for buildup IRs in educational Institutions

Usual communications and coordination with the librarians, officers, authors, faculty, publishers, patrons, researchers, students and elites are key contributors for buildup IRs. The following model may shows how educational institutions can develop IRs with the help of the contribution of the members of the same institutions.
FUTURE DIRECTION OF IRs

With the most recent developments around the world there seems to be more awareness especially in areas of open access and open content. The UK House of Commons, Science and Technology Committee report urges the government to allot funds to each and every university to set up IRs and ensure long term preservation of digital scholarship emanating from these digital repositories. The U.S. House of Representatives Committee on Appropriations followed suit with the recommendation of all NIH funded research to be archived in PubMed Central, 6 months after publication. In June 2006, the Research Council of UK (RCUK) issued the long awaited open access policy directing all its research to be published in Open Access. The Federal Research Public Access Act of 2006 in the US Senate is yet another milestone in the Open Access to Research literature. Similar proposals are being discussed in various other countries like Canada, Scotland, Australia, Norway and India. Such strong commitments from our Bangladeshi counterparts will certainly go a long way in creating and maintaining the Institutional Repositories in the higher educational institutions in Bangladesh. With these developments there is no doubt that the scholarly communications are poised for an exciting future. The increasing awareness among the authors and researchers is a very good sign for the future of scholarly publications. If our country can follow suit and try to emulate their peers and governments, it will go a long way in establishing an intellectual network of scholarly information sources, which will certainly fuel the intellectual renaissance in educational institutions in Bangladesh. Moreover, all the universities working in the public and private sectors, and other government funded bodies such as public libraries, museums, and archiving centers can also find ways to set up consortia of an open digital repository. Bangladesh must also think of launching a national digital repository by putting all the past and existing available resources of knowledge into one place. Therefore, the rest of the world would have greater accessibility of the available resources which is otherwise accessible to a very small population and/or may be on the verge of extinction.

CONCLUSION

IR can play a vital role in 21st century’s higher education and scholarly communication in developing countries. It is now clearly and broadly being recognized as an indispensable infrastructure to respond the higher education challenges in the digital world. This study provides an understanding of how IR relate to the higher education and scholarly communication, how to face challenges and discuss on how sharing institutional repositories can adjoin worth in this esteem. The higher educational institutions may get more researchers to contribute to the university institutional repositories by providing some incentives such as giving recognition of researchers’ contribution like acknowledgment and appreciation letters to those who will put in much of their work to the university institutional repository. However, this is an area that academic institutions need to invest uncompromisingly and also need to implement thoughtfully and carefully, and with a full understanding that may enduringly change the landscape of 21st century’s higher education.

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