Institutional Repositories in E-Learning

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ABSTRACT
Though the concept of Institutional repositories was developed as a part of personal pages or on departmental sites in the institutes but it is getting also attention of librarians. However, it is in its early stages in the field of library and information centers, it has emerged as an effective means for providing access to scholarly contents to its users. This paper explores the possibility of uses of institutional repositories in e-learning, particularly through the library and information centers.

Key Words
Institutional Repositories, Digital Libraries, E-Learning.

1. INTRODUCTION

Libraries have a specific responsibility to preserve information and in doing so they need to ensure that information resources remain permanently accessible, in working condition and authentic. However, the nature of information resources is changing fast because of developments in information and communication technology (Dhiman 2003; Dhiman and Rani, 2005). In fact, it is in flux with more information being migrated to digital format and more made available in digital format, because it is born digital. It is therefore not surprising that information in electronic format represents the prime and fastest growing collection in academic libraries today. These and other developments such as the open access movement have increased the interest in institutional digital repositories. This was usually done as part of their personal pages or on departmental sites (Lynch, 2003a) and the concept of digital repositories has grasped the imagination of leaders in the field who had a vision of the benefit to be derived from doing just that. Now institutional repositories are the effective mean to organizing the random posting of scholarly communications into well structured, secure and attractive virtual spaces for the benefits of users.

2. What an Institutional Repository is?

The Institutional repository is a contemporary concept that captures and makes available as much of institutional research output as possible to the users. It is a sort of a database of digital information resources, accessible through Internet or Intranet. In the first instance this might include electronic versions of documents such as research papers, project reports, patents, theses and dissertations (Barton and Waters, 2004) but institutional repositories are the digital information warehouses of modern academic institutions.

Lynch (2003), has described institutional repositories as "a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members". It is an "archival, stewardship and dissemination systems for content that have a fairly heavy policy component in terms of who can deposit, what metadata is required for deposit, acceptable formats and the implications of format choices for institutional preservation guarantees (Mclean & Lynch, 2003)." A repository may include a variety of information produced by faculty members, research scholars and the administrators of the institution like the text of journal articles accepted for publication, technical reports, white papers, research data, theses, dissertations, work in progress, important print and image collections, teaching and learning materials and materials documenting the history of the institution (Hirwade and Hirwade, 2006). It may also include many of the digital assets generated by an institution such as working papers, lectures, conference proceedings, learning objects, administrative documents, course notes, etc. The learning objects may include among others study materials, assignments, question papers, audio-video materials and multimedia presentations such as interactive e-learning modules. The copyright of the work in the institutional repositories may be owned by the author or the institution or for which permission has been obtained to include the work in the repository.

3. Objectives of Institutional Repositories

There are various objectives of institutional repositories, but following are the main objectives for having an institutional repository:

- to create global visibility for an institution's scholarship;
- to collect content in a single location;
- to provide open access to institutional research output by self-archiving it; and
- to store and preserve other institutional digital assets, including unpublished or otherwise grey literature, like theses or technical reports etc.

3.1 Features and Functions of Institutional Repositories

The key features of professionally managed institutional repositories are – rich digital contents, up to date full-length

institutional research papers, full participation of all research scientists of the organization, and fully supported by top administration. Gibbons (2004) identifies the five core features all institutional repositories have in common as:

- Digital content;
- Community-driven and focused;
- Institutionally supported;
- Durable and permanent; and
- Accessible content.

Further, Gibbons (2004b) lists the six core functions of an institutional repository as:

- Material submission;
- Metadata application;
- Access control;
- Discovery support;
- Distribution; and
- Preservation.

SPARC lists similar "core" features and functions but includes the qualifier "scholarly" in its list describes institutional repositories as having four key attributes: institutionally defined, scholarly, cumulative, and open. But more technically an institutional repository must bear following features.

Interoperability: Interoperability means the adoption of an interoperable protocol that is necessary to expose metadata associated with repository's collection to external systems and search engines for dissemination of contents. "Open Archives Initiative" has developed such a protocol to facilitate efficient dissemination of repository metadata. This protocol is known as Open Access Initiative Protocol for Metadata Harvesting or simply - OAI-PMH (Open Archives Initiative. 2002). Under this model, metadata is harvested (extracted) from Data Providers (Repositories) by Service Providers (Search Engines).

Categorization Scheme: It is a directory-type structure which is a useful arrangement especially for users not looking for a particular item. It groups related items and provide easy navigational facility. Subject categorization is considered the most helpful arrangement for any repository. It would be better if a standard classification scheme is adopted, however, a departmental/school-wise categorization separately or sandwiched into the subject classification can also be adopted. Further, the arrangement by authors and years are some other arrangements that might be considered for repository designers.

Reliability: Reliability means the depositors must convince that there are definite benefits in taking the trouble of uploading. They at least want to ensure that repository is fairly reliable and trusted. Servers should be up round the clock with persistent IDs or URLs to enthuse trust among the depositors. They need to be convinced that repositories can play crucial role in exposing their works to their peers. Institutional commitment and self-archiving policies are important in cultivating sense of trust towards institutional repositories. Further the reliability of links also encourages other authors to cite works from repositories.

User Friendly: An institutional repositories must be user friendly. The documents in institutional repositories are uploaded most of the time remotely without any assistance from the repository staff. So, proper metadata along with proper subject headings must be included along with intuitive and user-friendly interface.

Institutional Repository in E-learning

E-learning is becoming an influential force in higher education today, which has some kind of presence on almost every campus and in an ever-increasing number of college and university courses. It is becoming an effective method of learning in digital environment. E-learning is variously defined as under :

> E-learning is the `online instruction as an innovative approach for delivering instruction to a remote audience using the web as the medium' (Khan, (1997).

> To Carliner (1999), `e-learning is the educational material that is presented on a computer.'

> A very simple definition of this is given by Hoppe and Breitner (2003), where they define e-learning as `a learning which is supported and/or made possible by the use of modern ICT and computers'.

> According to Ong et al., (2004), it is the `instructional content or learning experience delivered or enabled by electronic technologies.'

> Laurillard (2006) has defined e-learning as `the use of any of the new technologies or application in the service of learning or learner support.'

> While to Newman (2008), it is `the usage of modern ICT to deliver learning and training programs'.

Whatever the definition may be but the key elements in e-learning are lecturer, content, students, place, time and interactivity. Therefore, an e-learning process comprises conceptual and physical components and procedures that should be both standardized in terms of procedures and technologies. The enhancement of traditional classroom activities with electronic elements—epitomized by the rise of the course management system—is changing the way faculty and students access, create and use information. It is providing new opportunities for libraries to design and to disseminate new services, so that they can quickly highlighted their expertise, abilities and irreplaceable resources in order to take a leading role in the new mode of learning, i.e., e-learning.

It is also realizing that students in addition to learning and understanding existing knowledge need to produce new knowledge in order to be a part of the "knowledge society". And for these demands, new forms of teaching and learning are required that build upon the possible interconnected nature of goals, tasks, resources, roles, pacing and social structure, as shown in Figure 1. This interconnectedness can be very effectively supported by the use of ICTs, particularly in libraries.

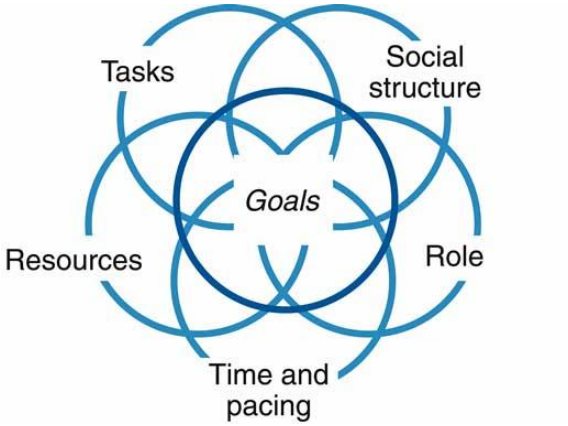

Figure 1 : Key Components required for Enhanced Teaching [Learning] (After Watkins et al. 2002)

Institutional repository is one of the components of e-learning, where institution displays its worthwhile research programmes, projects, and initiatives to the broad spectrum of its users. The institutional repositories offer seamless access to documents that reflect past and present research interests of the institution as well as its future research goals. They make the publications more usable by contemporary and future scholars as well as other professionals like policy makers and social workers. Within educational institutions repositories do not have a single home. Specialist centres, departments, or technical support services may administer them. They may also be run by the institutional library service. When this is the case, the term digital library is likely to be used instead of digital repository or digital archive. Like many other digital repositories, digital libraries do not necessarily include preservation in their remit. Pinfield describes the digital library as "a collection of networked digital information resources and associated technical and managerial infrastructure" (Pinfield, 2001), a definition which shares much with other definitions of transitive digital repositories.

Traditionally, libraries have acted as institutional store places for research and learning resources. Digital libraries and institutional repositories expand this role into digital materials, while maintaining ties to the existing expertise and managerial infrastructure of an institutional library service. Unfortunately, despite what might seem to be a central position within the institution, developments in the digital library are not always well coordinated with e-learning developments. Librarians are, however, heavily involved in the development of the emerging concept of institutional repositories and they are intended to capture, preserve and disseminate a university's collective intellectual capital (Crow, 2002), although at the present time, the focus is on capturing research literature.

The pace of scholarly communication would be highly accelerated if the institutional repositories hold research papers, research reports, etc. as soon they are made public. This also helps publications in receiving more citations, since the research findings are quickly available to the fellow scholars. Institutional repositories along with open access movement have certainly helped the Indian journals to reach an international audience, as could be seen by the number and distribution of article downloads. For example, the *Journal of Postgraduate Medicine*, a quarterly journal with a print circulation of less than 1,000, attracts close to 100,000 visitors with more than 110,000 article downloads per month. The increased accessibility and visibility has also increased the citations received by this journal (Sahu, Gogtay and Bavdekar, 2005).

Institutional repositories of an institution's research output are important as a natural extension of the academic institution's responsibility as a generator of primary research, seeking to preserve and leverage its constituents' intellectual assets as one major component in the evolving structure of scholarly communication. The need to capture digital e-learning courseware is essential to ensure that the institution continues to maintain the right to use and build on educational programmes produced for local courses (SPARC, 2003), and can be kept preserved for a long time. This is also important to help to maintain information after an academic move to another organization and for an institution's general development. Academic staff and students need to store and retain their intellectual assets, which will be a boon for them (Dhiman, 2010). They also need to make their work available and visible to others within and outside the institution, while managing their digital rights and maintaining the integrity of their work. Lynch (2003) also emphasize on the potential of institutional repositories as it is "opening up entire new forms of scholarly communication that will need to be legitimized and nurtures with guarantees of both short and long term accessibility".

The other benefit of institutional repositories is that they enable the free sharing of information, encouraging collaboration and the widespread communication of institutional education and research activity. Institutional repositories also provide access to other digital documents of the respective institution and lecture, notes and question – answer on web. The same can be useful for the e-learners. E-learners can consult these documents at any time, any where without coming into classes, which is an advantage over class room reading.

Institutional repositories can be used throughout the institution and collaborative institutions. Institutions like IISc; IIT (Delhi & Kharagpur); National Institute of Technology (NIT), Rourkela; National Aerospace Laboratories, Bangalore; National Chemical Laboratory, Pune; INFLIBNET, Ahemdabad; National Institute of

Oceanography, Goa; Raman Research Institute, Bangalore etc. and NISCAIR, New Delhi have established *Open Access Institutional Repositories* (Singh et al., 2006), which are disseminating research outputs of their respective institutions in India. Some of them are only providing access to metadata to the external communities who are accessing these repositories through Internet, whereas internal members who are accessing these repositories through Intranet are getting access to full-text information besides metadata. Sometimes some areas may overlap with each other. Using institutional repositories, the grant providing agencies can evaluate the novelty of a research proposal and come to know whether any study has been already undertaken in a particular area or discipline to avoid any duplication.

4. CONCLUSION

Thus, with the advancement in information and communication technology, the popularity of institutional repositories is growing rapidly in the higher educational and research institutions to disseminate its knowledge and expertise (Dhiman and Sharma 2008 a & b). When an institution shares its own knowledge resources, it not only accelerates knowledge generation and scholarly communication process, but also increases its visibility across the national and world. Institutional repositories have emerged as an effective mans for scholarly communication, but the collection development of an institutional repository is a crucial point for its success and its long-term sustainability. The collection development policy of institutional repositories needs to be reviewed regularly and users' feedback obtained from the user communities. It is seen the users of institutional repositories comprising of faculty members and the students are also more inclined to submit their resources to a repository when tools and methods to aid in the creation of materials are available within the repository interface.

Further, their popularity can be increased through postings in list servers, web search engines, metadata harvesting services and publicity campaigns. The repositories should also be linked from the institutions' respective websites. Additionally, if the works of an individual researcher get an international attention, his or her publications would be accessed more through institutional repository and would be of great value to its collection. Ultimately all these things will be a boon for e-learners also. But an attitude of "if we build it, they will come" is not sufficient, rather community-oriented repository projects of the future must continuously address technical issues along with community building concepts to establish a good balance between being a storehouse of searchable knowledge and enabling communication and interaction among a community of individuals.

5. REFERENCES

1. Barton, Mary R. and Waters, Margaret M. (2004). Creating an Institutional Repository: LEADIRS Workbook. Massachusetts: MIT Press. Available at: http://dspace.org/implement/leadirs.pdf.
2. Carliner, S. (1999). Overview of Online Learning. Human Resource Development Press, Amherst, MA.
3. Crow, R. (2002). The Case for Institutional Repositories : A SPARC Position Paper. SPARC 2002. Available at : http://www.arl.org/sparc/IR/irFinalReelase102.pdf.
4. Dhiman, A.K. 2003. Basics of Information Technology for Librarians and Information Scientists. 2 Vols. Ess Ess Publications, New Delhi.
5. Dhiman, A.K. and Rani, Yashoda. 2005. Learn - Computer Basics and its Application in Libraries. Ess Ess Publications, New Delhi.
6. Dhiman, A.K. and Sharma, Hemant. (2008a). Institutional Repositories: the Emerging Gateways of Accessing Knowledge in Networked Environment. *University News.* 46 (5): 100-03.
7. Dhiman, A.K. and Sharma, H. (2008b). Access of Scholarly Publications through Institutional Repositories. *Pakistan Journal of Library Science.* 9 : 97-111.
8. Dhiman, A.K. (2010). Institutional Repositories : the Boon for Academic Community. In K.M. Khan, V. Gopakumar and B.K. Vishala edited `Empowering Library Professionals in Managing Digital Resources. St. Agnes College (Autonomous), Mangalore. Pp.152-57.
9. Gibbons, S., (2004a).Defining an Institutional Repository. *Library Technology Reports.* 40 (4) : 4, 6-10.
10. Gibbons, S. (2004b), Benefits of an Institutional Repository. Library Technology Reports, 40, No. 4, 11-16.
11. Hirwade, Mangla and Hirwade, Anil. "Institutional repositories: challenges and opportunities for LIS professionals in digital age." Library Herald 44 (2006):146-157.
12. Hoppe, G. and Breitner, M. (2004). Business Models for E-learning. Conference proceedings of the E-learning: Models, Instruments and Experiences Multikonferenz Wirtschafstinformatik, Essen, Germany. Available at http://www.wiwi.uni-hannover.de/Forschung/Diskussionspapiere/dp-287.pdf.
13. Khan, B. (1997). Web-based Instruction : What is it and Why is it? In B.H. Khan edited `Web Based Instruction. Educational Technology Publication, Englewood Cliffs, NJ. Pp. 5-18.
14. Ong, C.S. et al. (2004). Factors affecting Engineers' Acceptance of Asynchronous E-learning Systems in High-tech Companies. *Information & Management.* 41 (6): 795-804.
15. Laurillard, Diana. (2006). E-learning in Higher Education. Available at: www3.griffith.edu.au/03/ltn/docs/Eleraning_in_Higher_Education.doc.
16. Lynch, Clifford. (2003). Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age. *Portal: Libraries and the Academy.* 3 (2): 327-36.
17. Mclean, N and Lynch, Clifford. (2003). Interoperability between information and learning environments – bridging the gaps, Draft version. IMS

Global Learning Consortium & Coalition for Networked Information. Available at: http://www.imsglobal.org/DLims_white_paper_publicdraft_1.pdf.

18. Newman, (2008). Advantages and Disadvantages of E-learning. Available at http://www.newman.ac.uk/Students_Websites/~m.m.friel/.
19. Pinfield, S. (2001). Managing Electronic Library Services: Current Issues in UK Higher Education Institutions. *Ariadne* No. 29. Available at: http://www.ariadne.ac.uk/issue29/pinfield.
20. Sahu, DK; Gogtay, NJ and Bavdekar, SB (2005): Effect of open access on citation rates for a small biomedical journal. In: Fifth International Congress on Peer Review and Biomedical Publication, Chicago, USA.
21. Singh, D., R.V. Prasad, V Pawan Kumar, Shiva Prakash and K.N. Jha. (2006). Institutional Repository : An Overview. Open Source Movement ; Asian Perspective. *XXII IASLIC National Seminar*. An IASLIC, Kolkata Publication. Pp. 119-24.
22. Watkins C., Carnell E., Lodge C., Wagner P. and Whalley C.. (2002). Effective learning. NSIN research matters, Institute of education, University of London Available at : http://www.ioe.ac.uk/iseic/research.pdf.