Institutional Repositories: New Horizon of Science & Technology Knowledge Transactions

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Abstract. Today higher education system and R&D in science & Technology has undergone tremendous changes from the traditional class room learning system and scholarly communication. Huge volume of Academic output and scientific communications are coming in electronic format. Knowledge management is a key challenge in the current century .Due to the advancement of ICT, Open access movement, Scholarly communications, institutional repositories, ontology, semantic web, web 2.0 etc has revolutionized knowledge transactions and knowledge management in the field of science & technology. Today higher education has moved into a stage where competitive advantage is gained not just through access of information but more importantly from new knowledge creation. This paper examines the role of Institutional repository in knowledge management and knowledge transactions in current scenario of Higher education.

Keywords: Institutional repositories, Knowledge management, scholarly communication

1 Introduction

Development of a Nation largely depends upon its activities in the field of science and technology. Scientific research in areas such as agriculture, industry, transport, defense, finance etc forms an important factor for National development. It is equally important that the output of this research is not confined to the laboratory, but reach the beneficiaries in time. Nowadays Government is spending huge amount of its revenue for the development of science and technology. In other

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words, majority of the R & D works is done with the public money, and for making the public its real stakeholders, information/knowledge being generated by the R & D activities need to be made available in the public domain. In this context, Institutional repositories can play an important role.

The emergence of open access movement, institutional repositories and advancement in ICTs such as web2.0, semantic web, etc has revolutionized knowledge management and knowledge transactions in the modern era. This paper explains how an Institutional repository of Cochin University of Science Technology serves as a new platform to knowledge transactions in science & Technology.

One of the key factors that distinguish the intelligent business enterprise of the 21st century is the emphasis on knowledge management and information. Unlike the past, the fast and competitive higher education of today with global emphasis requires the ability to capture, manage and utilize knowledge and information in order to improve efficiency, promote interdisciplinary research keeping in pace with the never ending changes[3].

2 Paradigm Shift in the Scientific Communication

Conventionally, the output of scientific research is communicated through research journals. It is circulated only among the scientific community, that too of a particular subject discipline. The cost factor which is on the higher side affects the availability. The Publishers have the monopoly in the scientific journal publishing industry, even author do not have the right to distribute his/her research outputs to the community.

Over the past century revolutionary changes have reshaped the scholarly communication in the field of science & technology literature. 80% of the scientific communications and scientific literatures are in digital form and in various formats[2]. Majority of the publishers are now supporting self archiving and open archive Initiatives. Knowledge management and transactions are the major challenges posed by the information professionals as well as the scientific community.

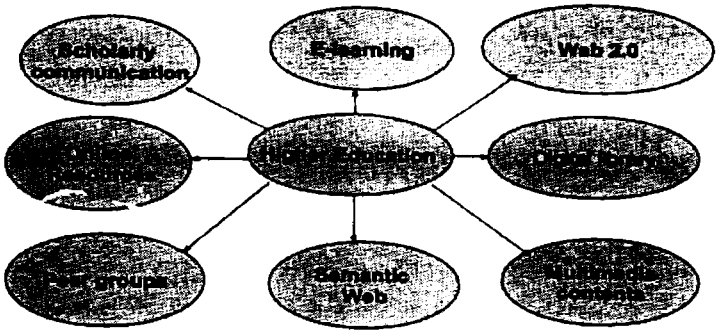
Today institutional repositories are new arena for knowledge management, because they cover the content acquisition, reformatting, storage and retrieval and knowledge transfer both globally and locally.

Institutions like universities and other R&D institutions are producing large volume of academic and R&D literature in electronic format. Rapid changes in ICT and electronic communications during the past decade have given us the ability to create, aggregate, manipulate, store, and transmit much more data and information than ever before. It is now a fact that large amount of information are transmitted via the internet and other means on a daily basis. These academic and research outputs are absolutely the contents of an IR[1].

3 Background of the work

Cochin University of Science and Technology (CUSAT) is a pioneer institution in our country conducting research in Science and Technology in different disciplines under nine faculties spread over 32 departments such as Marine Sciences, nanotechnology, Biotechnology, fisheries, applied sciences etc Scientific research in CUSAT are interdisciplinary in nature and the R&D outputs are published in different forms and usually circulated only among the scientists and experts working in the relevant discipline. There can no academic or R&D institution which is self sufficient in their information resources. It is therefore very essential to have resource sharing and collection mobilization in the R&D of Science & Technology. Research in CUSAT is highly interdisciplinary in nature and is linked with social, economic, cultural, industrial, educational, scientific, and environmental development of the region as well as the Nation.

4 Current Information Landscape for Higher education



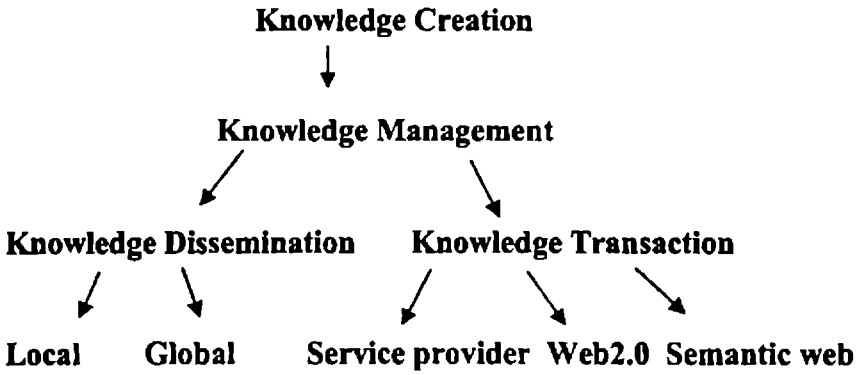
5 Why Institutional Repositories?

Institutional repositories (IR) are a new breed of services and software, still in their infancy. IR is defined as a set of services that an Institution offers to the members of its community for the management and dissemination of digital materials. The open source movements adopting the idea of institutional repositories are Eprints, GreenStone and DSpace the Government is promoting the development of Institutional repositories, Digital repositories, digital archives etc in the institutional, national and Global level. Institutional repositories are created to manage, preserve, and maintain the digital assets, intellectual output, and histories of institutions. These repositories provide services to faculty, researchers, and administrators who want to archive research, historic, and creative materials. The open access and open archives movement are trying hard for the changes in scholarly communication pattern, removing barriers to access, increasing awareness that universities and research institutions are losing their

valuable digital and print materials. Thus motivating establishment of institutional repositories

6 What is Knowledge Transaction

Many social interactions can be treated as transactions. Interactions through sharing of knowledge are called knowledge transactions. Knowledge transaction is not a single entity; in a university, knowledge creators such as Faculty, Scientists & Research scholars provides knowledge and is exchanged or shared within the organization and across the organizations over the globe.



7 Knowledge Transaction Model in CUSAT IR

CUSAT Repository is covering the contents of scientific research outputs of different disciplines such as Marine sciences, Fisheries, Environmental Science, Astronomy & Astrophysics, and Nanotechnology, legal literature, Biotechnology, Neuroscience, Applied science and Technology etc. CUSAT is the one of the pioneer institution in the Nation conducting R&D in the area of Science & Technology. The content covered in the CUSAT IR is conference Proceedings, Working papers, gray literature, Thesis, Learning materials, multimedia contents etc

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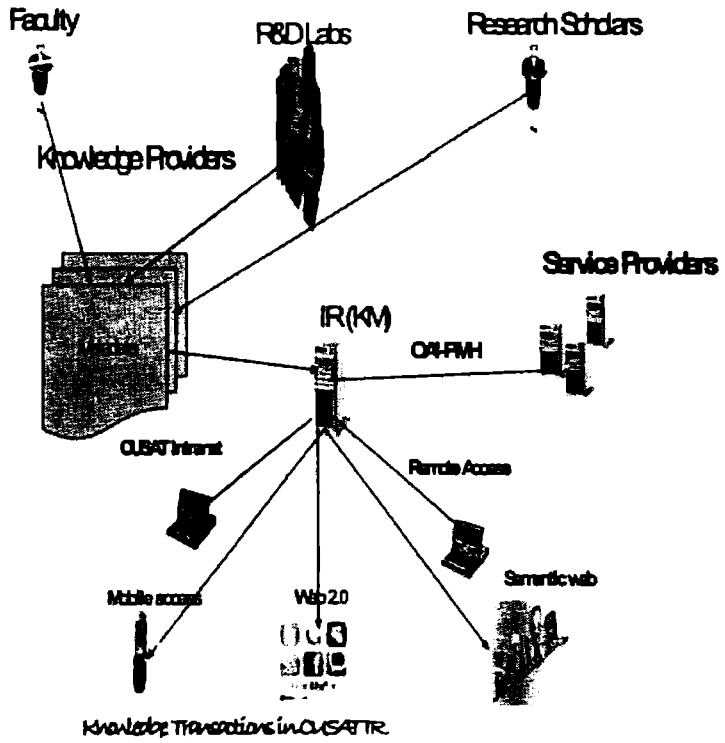
IR supports aggregating the scattered contents created by our faculty, research scholars, and scientific community in different discipline, converting into digital forms and managing in a meaningful way such as metadata tagging, metadata creation, storage & indexing for easy dissemination and transactions of knowledge.

One of the basic features of an IR is OAI-PMH (Open Archive Initiative for Metadata Harvesting). This OAI-PMH helps to expose metadata for supporting interoperability, cross archive aggregation and searching thereby facilitating the efficient dissemination of content. This facility of an IR helps the scientific community to cross walk into different nationally and internationally reputed Institutional repositories.



The cross repository service (OAI-PMH) supports the academic community to build discipline based community output sharing,

citation links etc. These facilities promote interdisciplinary research in S&T. web 2.0 applications supports the sharing of knowledge between the social Networks. OAI, web 2.0 semantic applications etc will provide the multiple strategies for knowledge sharing such as greater citation, maximize the visibility, usage and impact of this research through global access. The cross repository services support to exploring the knowledge transactions process with collaboration between team/groups working asynchronously at distributed locations.

8 Conclusions

The scope of the Institutional repositories is not limited to mere storage and preservation of information. In broader perspective digital repositories or Institutional repositories will support the scope for advanced research in science & Technology. IR plays a major role in Knowledge transactions within the institution and across the institutions over the globe. The major features of an IR such as OAI-PMH, web 2.0, semantic linking etc support the knowledge transactions in different models. Knowledge transactions in science & technology support R&D and promote interdisciplinary research. Hence the development of repositories in different disciplines and their global availability should be encouraged.

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