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Implementation of Institutional Repository using DSPACE: A Case Study at University of Peradeniya

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ABSTRACT

This article describes the Implementation of Institutional Repository using Dspace Software at the University of Peradeniya. This IR is aimed to give access to research scholarly articles to the Institution's researcher and to make the visibility of the University of Peradeniya researcher. It also gives access to University database and more importantly some of the logical approach is made in different collections and communities. This article also explains the hard and software requirements provided along with information about the open source software. This article provides evidence on how the University of Peradeniya IR was built from scratch and how various different types of collection with many forms and file formats can be uploaded using Dspace software. Huge amounts of problems were faced during the installation and customization of metadata forms for different collections using Dublin core metadata fields. Dspace permits workflow, customization and community/collection based content and submission by different user communities. This paper helps in planning to build an IR and also helps the beginners in getting an idea of how different file formats can be used for different collections in order to maintain uniformity.

Keywords: Institutional repository, D space, Digital collection

INTRODUCTION

The idea of converting library materials into digital formats for creating digital collections has advanced rapidly in the last few years, thus leading to the concept of a virtual library or a library without walls. Making the concept functional involves the use of hardware and software for capturing and converting an item into a digital format. Further, it is to be matched by developing a set of methods for describing and retrieving the digital information. The collections, services and information needs of the University of Peradeniya library are different from other types of libraries. The information required for R&D work, Engineering, Agriculture, dental, Medical, Veterinary Sciences, Management, Allied Health Sciences, Arts and Science members and students are normally available in books, journals, technical reports, patents, standards, theses, databases, institutions websites etc., in various places and also in various formats and media. These users require the latest information for the time bound for their study. It is very difficult for a single library to acquire all these resources and provide them to their users, yet, at the same time, it is the duty of the librarian to provide the required latest information, wherever available and in whatever form and whenever required. Universally, librarians are being urged to digitize information in anticipation of the advantages. Even if this new technology does, indeed turn out to be revolutionary, one should be cautious keeping in mind the limitations. It is important to find out the various patterns in digital applications that enable effective and creative use in the traditional library functions of collecting, reserving, and making information accessible. That is

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before the process of digitization, it is better to study patterns that can help one access "if and when technology will be able to meet expectations for improvement of traditional library services; when it cannot, and when it may do so, but not in a cost-effective manner." So the University of Peradeniya Main library is fully computerized and equipped with latest technology, barcode circulation, online electronic databases.

Institutional Repository

Institutional Repository 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 dissertations³. 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. Advancement of information and communication technologies has made the institutional repository a reality. Institutions both in developed as well as developing countries have started establishing institutional repositories.

Current Library Facilities and Trends

The current library system and services at the University of Peradeniya ranks high amongst top institutions in Sri Lanka. The Library has computerized all its housekeeping activities using software developed in-house that is being maintained and updated regularly. Our first priority is to enhance the collection by using power and efficiency of digital library. By adding more digital resources, the faculty members, Research Scholar and students will immensely benefit in their academic pursuits. It is proposed to strengthen the Digital Library in phases.

Infrastructure for Digital Library in the University of Peradeniya

Infrastructure is an umbrella term for many activities. Digital Library infrastructure is usually considered with respect to its main areas such as computer hardware and software, telecommunication and networking.

Database and e-Journal

DSI Institute has been selected for the implementation of the electronic resources like INDEST-AICTE, J-Gate, BITES, DELNET which provides access to database of books, current periodicals, periodical articles and CD-ROM databases. E-Journals have almost all the characteristics of the printed journals (p-journals) and would be available either online or offline (CD, DVD) or both. Publishers like ASCE, ASME, IEEE/IEE, ACM Digital library etc., offer subscription.

Advantages of subscribing to full-text journals/contents pages:

The following are the advantages of subscribing to full-text journals/contents pages:

- Access to latest information earlier than the printed version
- Access to contents page of journal free of cost
- Allows search using several attributes/data elements
- No need to create and maintain the database locally

- These journals can also be subscribed through consortium. Subscribers have to pay an extra percentage over and above the cost of the printed version. Members of the consortium have online access to full-text journals subscribed by participating libraries.

Objective

The main objective of implementation of institutional repository are as follows:

- To build institutional repository to provide right information to the right user at right time
- To collect, organize, submit and retrieve scholarly articles of both pre-print and post print of the institutions.
- To give sustainable support to higher education and research in the academic set up.
- To allow institutional staff and students to submit and access the digitalize content which will help them to open access interaction.
- To reduce institutional budget by allowing self publication instead of publisher and Vendors
- * To work out problems and solutions associated with implementation of open source software in academic institution.

METHODOLOGY ADOPTED

The present study covers how to build an Institutional Repository for the University of Peradeniya by using Open Source Software like Dspace.

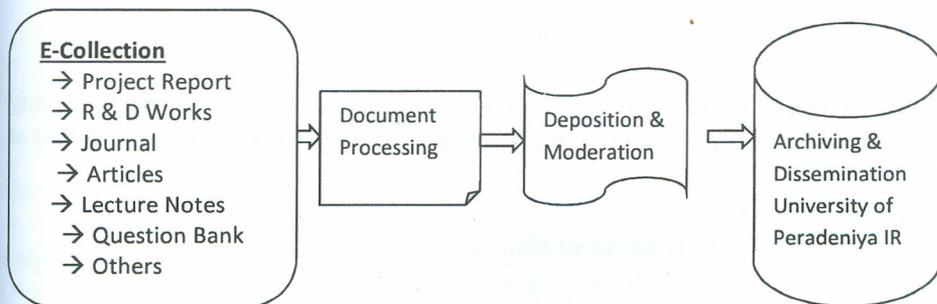


Figure 1: processing method

SCOPE OF THE STUDY

The project is based on the study of available Open Source Software (OSS) useful to libraries in general. It includes integrated library systems (ILS), cataloguing tools, resource sharing tools, digital library tools, and other information service tools useful in day-to-day functioning of the libraries.

Dspace Needs for the University of Peradeniya Digital Library

The growth of electronic information over the decades and the democratization of the Internet have paved the way for the emergence of digital libraries. Digital libraries are more than a mere collection of digital documents. It can be seen as an extension of the existing libraries with all the three basic functions, viz., collection, organization, and dissemination of digital information resources.

Development and Implementation of the Institutional Repository – University of Peradeniya Library, Sri Lanka

The digital documents in the IR are organized into different communities as can be seen in Figure 2, which cover the Administration and the Library as well as the subject-based departments, centres and schools of the institute. New communities will be created as and when they are required depending on new and emerging subject areas and activities within the University of Peradeniya Library.

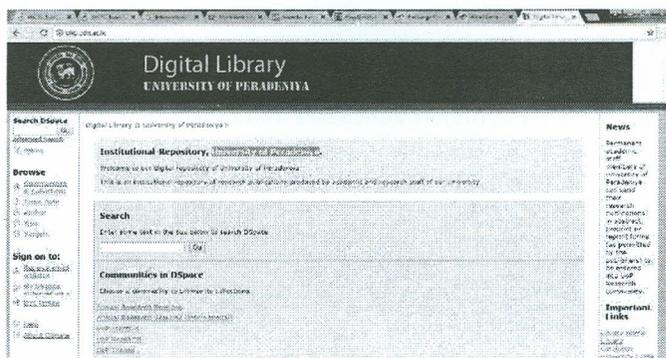


Figure 2: Home page of Digital Library of the University of Peradeniya

At present some Annual Research Sessions, University of Peradeniya Journals, University of Peradeniya Research and these works are uploaded.

Materials included

Registered faculty members, research scholars and research assistants working at the University of Peradeniya may submit their documents to the IR. Each community has some distinct classes of collection:

- Annual Research Sessions
- Annual Research Sessions (International)
- UoP Journals
- UoP Research
- UoP Theses

Hardware System Requirement

The specification of the server for the IR at the University of Peradeniya is shown in Table I. In addition, a high-speed face-up book scanner with Optical Character Recognition software was acquired to digitize print documents and an MPEG card was acquired to convert video recorded documents into digital form.

Software System Requirement

A decision was made to use open source software and the options outlined in Table II were investigated. DSpace (www.dspace.org) was chosen as it provided an open source technology platform, which can be customized to meet our future needs:

- a service model for open access and/or digital archiving for perpetual access
- a suitable platform for building an IR

- inter-institutional full sharing of digital information, scholarly communications with easy interoperability of resources and systems
- OAI-PMH compliance

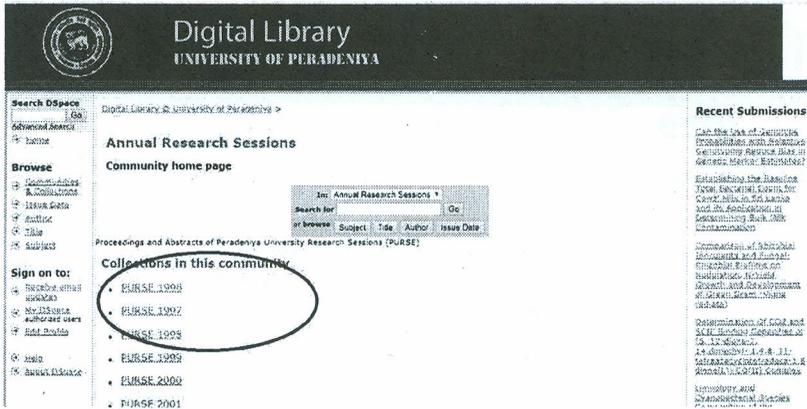


Figure 3: Communities & Collections page

Lucene searching (supporting fuzzy search logic) and the "handle" system (for global unique ID of documents) and in addition, other software were needed to run DSpace including:

- UNIX-like OS (Linux, HP/UX, etc.);
- Java 1.4;
- Apache Ant 1.5 or later (Java make-like tool);
- PostgreSQL 7.3 or later, an open source relational database; and
- Jakarta Tomcat 4.x/5.x or equivalent.

Also, an Acrobat PDF maker was acquired to convert MS documents to Adobe PDF.

Submitting Content to the Institutional Repository at the University of Peradeniya

New users who wish to submit content have to register on the IR by completing a special form. The following are then the basic steps, which need to be followed for the submission of material:

- user chooses a collection;
- user describes the content of the item by adding metadata and keywords;
- user uploads the file(s);
- user verifies the submitted item;
- user accepts the licence;
- DSpace management system "processes" the submission according to the workflow steps outlined in Figure 4. content is submitted into the IR at the University of Peradeniya.

As users enter information about an item, the status line at the top of the relevant window shows where they are in the submission process. Users can change their entries and return to a previous step to make changes by clicking on that step in the status bar.

The seven-step chain, as shown in Figure 4, indicates the submission process. The chain appears at the top of all the screens with the current screen highlighted. The first screen asks for the "type" of digital item (animation, article, book, book chapter, dataset and so on), the language of the

content (English (US), English, Spanish, German, French and so on) as well as whether the item has more than one title, whether it has been published before and the number of files to be included. The second and third screens present the forms for the user to enter Dublin core metadata elements (such as author, title, publisher, subject keywords, abstract, and sponsors).

Figure 4: D space of the National Centre for Science Information (NCSI) is the information centre of Indian Institute of Science, Bangalore

The fourth screen allows uploading of the digital document which may be MS-Word, HTML, PDF or image files or other acceptable formats. The fifth screen allows verifying and making any corrections to the data submitted in the last four screens. Figure 5 shows the completed form for one item.

Figure 5: completed form for one item

Users can verify the information submitted and can correct information, add or remove files as necessary.

Primary benefits of the Institutional repository at the University of Peradeniya

There are many benefits of the IR at the University of Peradeniya such as:

- It enhances the professional visibility of the faculty and raises the prestige of the University of Peradeniya.

- It provides a global platform for local research and hence improves visibility.
- It facilitates improved research collaboration and information flow.
- It brings together the intellectual output of the University of Peradeniya in an organized fashion, which otherwise would be scattered.
- It lowers access barriers and offers the widest possible dissemination of an individual scholar's work.
- It improves citation rates for published articles.
- It makes it easy and appropriate to cite works in the IR via the Persistent Naming conventions.
- It preserves and provides long-term access to the scholars' research output and serves as a resource for supporting classroom teaching.

Barriers

The main drawback is the cost of digitization and preservation of files. In this aspect one can justify the cost of digitizing of a unique collection such as the collection of DSI library especially when it leads to increased access and usage of under-utilized collections. The disadvantage of digitization is:

- Scanning the original documents of the entire collection
- IPR Issues
- Authenticity and credibility acceptance of the digital resources
- Require special skills to set up and maintain the Institutional Repository
- Require special training.

CONCLUSION

The University of Peradeniya, Sri Lanka has successfully implemented an IR using the DSpace software and this model could be replicated in the other Universities. In such a scenario each University could act as a data provider for one central service provider and then users would be able to search in one place for research output from all of Sri Lankan Universities. Many libraries worldwide are involved in such interoperable IRs to improve access to local research for global access and the model suggested here would be applicable in Sri Lanka.

REFERENCES

- Sutradhar, B (2006) "Design and development of an institutional repository at the Indian Institute of Technology Kharagpur", *Program: electronic library and information systems*, Vol. 40 No. 3, pp. 244-255.
- Van de Sompel, H., Nelson, M.L., Lagoze, C. and Warner, S. (2004), "Resource harvesting within the OAI-PMH framework", *D-Lib Magazine*, Vol. 10 No. 12, available at: www.dlib.org/dlib/december04/vandesompel/12vandesompel.html
- Barton, Mary R. and Waters, Margaret M. (2004). *Creating an institutional repository: LEADIRS workbook*. Massachusetts: MIT Press.
<http://dspace.org/implement/leadirs.pdf>
- ePrints@IISc. (2005). ePrints@IISc: access statistics: country-wise access.
<<http://eprints.iisc.ernet.in/StaticCnt.html>> (retrieved on 01 July 2005).
- Lynch, C.A. (2003), "Institutional repositories: essential infrastructure for scholarship in the

digital age", ARL Bimonthly Report, Vol. 226, available at
www.arl.org/newsltr/226/ir.html

Mackie, M. (2004), "Filling institutional repositories: practical strategies from the DAEDALUS Project", Ariadne, No. 39, available at: www.ariadne.ac.uk/issue39/mackie/
Massachusetts Institute of Technology (MIT) (n.d.a), "DSpace user support manager",
available at: www.dspace.org/implement/user-support.html.