

# **Building IR in the academic libraries: Current Practices and future Possibilities**

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## **Abstract**

The Open access movement has gained increasing power as the part of global scholarly communication by enabling researcher's access information that is free available and sharable online. Although the importance of the matter is being conceived in developing countries like India.. IR has been developed at Indian Statistical Institute Library to help provide access to quality information services for students and faculty using DSpace. This paper reviews the best practices of software to adopt in day-to-day activities of the library. It describes the continuing revolving road map of its features, which is becoming more like a hybrid vehicle employing the open source software. These concepts and their benefits and importance to libraries are discussed. Benefits include lower costs, greater accessibility, and better prospects for long-term preservation of scholarly works. The paper concludes by formulating the best practice of digital library for information professionals of the 21<sup>st</sup> century.

*KEYWORDS/DESCRIPTORS: DSpace; Open Source; Practical Digital Library.*

## **1. Introduction**

Librarians are the center of the intersection of new technologies, products, and services. Librarians select, provide, and deliver the information resources critical for academic and educate and scholarship. Librarians not only provide access to resources but also teach students, faculty, academic staff, and the general public about information resources and technologies. Digital resources are being built up as self-service centers and librarians continue to play the role of information provider. Digital libraries offer such benefits as equitable access, reduced business of distance, timeliness, shared resources and content delivery. To create trure digital libraries, not just digital collections, will require librarians to work closely together to create and open, distributed

publicly accessible resources, as well as establish a collaborative structure to coordinate and guide implementation.

## **2. Open access, Sources**

Open access, open source software and standards are three concepts that have receiving increased attention lately in the library world. Open access to scholarly information has been hot topic for debate among librarians, scholars, and publisher over the last few years. The growth of the open access movement in particularly response to the enormous cost of many scholarly journals. Open access helps to ensure long-term access to scholarly articles. Libraries and others can create local copies and repositories of these resources. With the advent of new technologies and software programs, it is becoming increasingly less expensive to compile and distribute scholarly information. Open source software is that include source code is usually available at free of cost. Open source methods of software development have been around at least since Richard Stallman's pioneering effort with is GNU project in 1984- a project developed the free GNU operating system. Libraries can realize many advantages by using open source software is generally available at free of cost. Open standards allow for interoperability to exist between diverse library and eases data migration between systems [5] Three characteristics of open standards are (1) that any one can use the standards to develop software, (2) any one can acquire the standards for free or without a significant cost, and (3) the standard has been developed in a way in which any one can participate. The use of open standards can help assure interoperability of diverse systems. There are various software packages that are being used to create digital libraries.

## **3. Institutional Repository**

The open access movement has gained increasing power as the part of global scholarly communication by enabling researcher's access information that is free available and sharable online. Institutional repositories are digital collections that capture and preserve the intellectual output of a single or multi university community. Their aim is to provide access scholarly material without the economic barriers that currently exist

in scholarly publishing. Institutional Repository may collect any of the other many types of content produced at an institution including classroom teaching material, university annual reports, video recordings, computer programmes, data sets, photographs and art works.[9 ]

In the past few years, a growing number of institutional repositories are being built in USA, Europe, and Australia, UK. In the U.K, the JISC is funding the development of institutional repositories for several of their research institution. And in the USA, the e-scholarship repository was launched at the university of California, and now contains over 2000 papers. The other is institutional repository at MIT, which went public in 2002. The Dspace platform, developed by MIT and HP, is open source and available free of charge. According to recent statistics 3000 organizations have download the Dspace software since 1992. In India, the university of Mysore has developed digital library of Indian theses namely Vidyanidhi Digital Library, as an online resource and a technical facility for the creation, submission, archiving, and accessing of Indian theses and dissertations. While there are traditions of stewardship and best practices that have become institutionalized in the print environment, many of these traditions are inadequate. There is a need to identify few best practices that satisfy the requirements and are practical for digital library software.

#### **4. Current trend in Digital Library Software**

Digital libraries is an integrated set of services for capturing, cataloguing, storing, searching, protecting, and retrieving information, which provide coherent organization and convenient access to typically large amounts of digital information. The Open Source Software for libraries portal (<http://www.oss4lib.org>), established in mid 1999, listed some of the library related projects in table 1. These range from simple scripts to produce statistics to integrated library systems to institutional repository software. In this article highlights particularly Dspace, , which are widely used software systems for digital libraries.

**Table. 1. Open Source Software**

Name	URL	Type of Project
Apache	<a href="http://www.apache.org">http://www.apache.org</a>	Web server
Free BSD	<a href="http://www.freebsd.org">http://www.freebsd.org</a>	Unix Operating System
GIMP	<a href="http://www.gimp.org">http://www.gimp.org</a>	OS image manipulation Software
GNOME	<a href="http://www.gnome.org">http://www.gnome.org</a>	Unix desktop environment
KDE	<a href="http://www.kde.org">http://www.kde.org</a>	Unix desktop environment
Linux	<a href="http://www.linux.org">http://www.linux.org</a>	Unix Operating System
Mozilla	<a href="http://www.mozilla.org">http://www.mozilla.org</a>	Web browser
My SQL	<a href="http://www.mysql.org">http://www.mysql.org</a>	Database
Project Gutenberg	<a href="http://promo.net/pg/">http://promo.net/pg/</a>	Freely available digital content (Started 1971)
Open Office	<a href="http://www.openoffice.org">http://www.openoffice.org</a>	Office application suite
PHP	<a href="http://www.php.net">http://www.php.net</a>	OS Programming tool
DSpace	<a href="http://www.dspace.org">http://www.dspace.org</a>	Digital Library Software
Eprints	<a href="http://www.eprints.org">http://www.eprints.org</a>	Digital Library Software
Greenstone	<a href="http://www.greenstone.org">http://www.greenstone.org</a>	Digital Library Software

## 5. DSpace

Dspace is a digital library system designed to capture, store, index, preserve, and redistribute the intellectual output of a university's research faculty in digital formats. Developed jointly by HP labs and MIT libraries. Dspace architecture is consists of three layer architecture namely (a) application layer (b) business layer (c) storage layer. The application layer covers the interface to the systems, the web and user and interface and batch loader, in particular. The business layer is where the Dspace specific functionality, workflow, content management, administration, and search and browse modules. The Storage layer is implemented using the file system, as managed by Postgre SQL databases. Each module has a well-documented API. All original code is in the java programming language. Other pieces of the technology stack include a relational data base management system (Postgresql), a web server and Java servlet engine (Apache and Tomcat, both from the Apache Foundation), Jena (an RDF toolkit from HP labs), OAICat form OCLC and several other useful libraries. The system is available on source forge, linked form both the DSpace informational website and the HP labs site.(Smith et., al 2003)

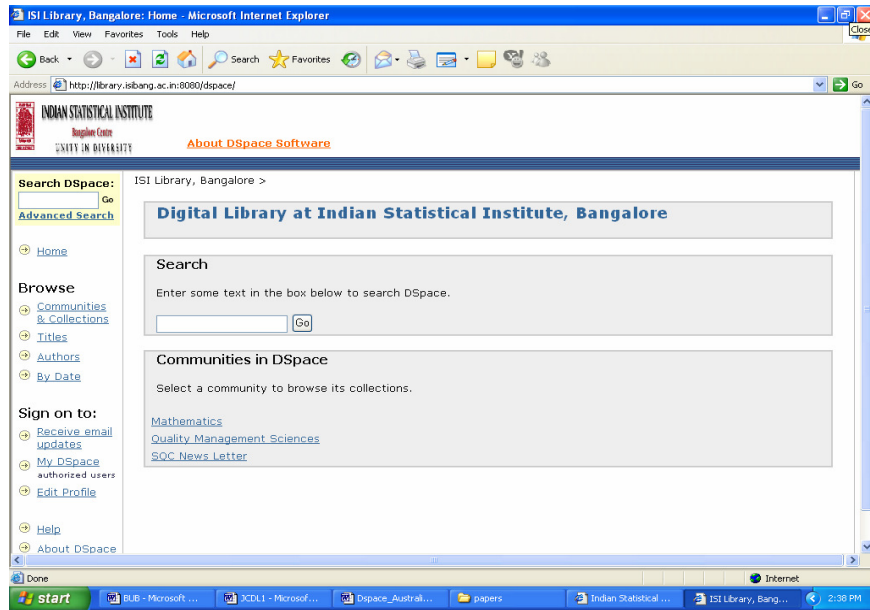
## **5.1 What can do Dspace**

DSpace software platform serves a variety of digital archiving needs. Research institutions worldwide use DSpace to meet a variety of digital archiving needs:

- Institutional Repositories (IRS)
- Learning Object (LO)
- E-thesis
- Electronic Record Management
- Digital Preservation
- Publishing
- And more

## **5.2 DSpace Architecture**

DSpace is based on a three layer architecture namely (a) application layer (b) business layer (c) storage layer. The application layer covers the interface to the systems, the web and user and interface and batch loader, in particular. The business layer is where the DSpace specific functionality, workflow, content management, administration, and search and browse modules. The Storage layer is implemented using the file system, as managed by Postgre SQL databases. The system is primarily written in Java, and uses only free software libraries and tools, including the Postgresql, RDBMS, Java servlet, Apache and tomcat, Lucene search engines, XML tools and RDF tool. Collections within communities consist of items. Items are, in turn, composed of one or more bit streams, or physical files of digital materials. Dspace item is single bit stream, for example of a digital image encoded as a TIFF file, or a digital documents encoded as a PDF file. A final example is a digital document that consists of a set of several HTML pages and some JPG images. [6]



## 6. Conclusion

Balancing traditional library with the new agenda of digital library activities has proved to be considerable strain on both financial and human resources. Digital library federation members have worked diligently to develop and promote standards such as Encoded Archival Description (EAD) and Metadata Encoding and Transmission Standards (METS) as well as models for user authentication. However, much work remains to be undertaken in many areas to create, adopt and disseminate standards that can be easily used the library community. The practical experience of digitization may be different in each case, but a clear understanding of the issues involved and techniques available can help maximize value obtained from limited source. A few of the solutions adopted for digitizations have been technology innovative, achievable and suited the purpose. . It can be used to create digital collections ranging from small library to large library.

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