DSpace Software: Institutional Repository for Digital Libraries

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Abstract

DSpace is an open source repository application that allows to capture, store, index, preserve and distribute our digital material including text, video, audio and data. DSpace provides a way to manage our materials and publications in a professionally maintained repository to give them greater visibility and accessibility over time. Open Source Software like E-prints, Greenstone, Dspace, etc., are widely available for digital library. Among these, the Dspace software is a digital library system designed to capture, store, index, preserve and redistributes the academic output of a university’s research faculty in digital formats. The Dspace is developed jointly by HP labs and MIT libraries. This article describes the Dspace system, types of Dspace content and discusses the use of Dspace for institutional repository.

Keywords: Dspace, Digital library, Institutional Repository, Digital Repository, Open Source Software.

Introduction

Digital resources are being built as self-service centres and librarians continue to play the role of information providers. Digital libraries offer such benefits as equitable access, reduced business of distance, timeliness shared resources and content delivery. To create true digital libraries, not just digital collections, will require librarians to work at closely together to create and open, distributed publicly accessible resources, as well as to establish a collaborative structure to coordinate and guide implementation.

It has three main roles:

- Facilitates the capture and ingest of materials, including metadata about the materials
- Facilitates easy access to the materials, both by listing and searching
- Facilitates the long-term preservation of the materials

The DSpace application has many customizable features and tools for managing digital content, enabling digital preservation and providing accessibility to our materials. As an open source application, there is a very active community of developers, researchers and users worldwide that contribute their expertise to enhance the DSpace application.

DSpace can be used to store any type of digital materials, including:

- Documents, such as articles, preprints, working papers, technical reports, conference papers
- Books
- Theses
- Data sets
- Computer programs
- Visualizations, simulations, and other models
- Multimedia publications
- Administrative records
- Published books
- Overlay journals
- Bibliographic datasets
- Images
- Audio files
- Video files
- e-formatted digital library collections
- Learning objects
- Web pages

Open Source Software

Open source software is computer software that is available in source code form for which the source code and certain other rights normally reserved for copyright holders are provided under a software license that permits user to study, change and improve the software.

Open source software is the software usually available free of cost. It was developed by Richard Stallman’s whose pioneering efforts developed the free GNU operating system. Such software is advantageous for libraries too. It allows existence of interoperability between diverse libraries, and eases date migration between systems. Three characteristics of open standards are (i) anyone can use the standards to develop software,(ii) anyone can acquire the standards for free or without a significant cost, and (iii) the standard has been developed in a way in which anyone can participate. The use of open standard can various software packages that are being used to create digital libraries.

The open source software for libraries portal (http://www.oss4lib.org), established in mid 1999, listed some of the libraries related projects that are
listed in following Table. These range from simple scripts to produce statistics to integrated library systems to institutional repository software.

**Electronic Resources and Digital Services**

**Types of open source software**

<table>
<thead>
<tr>
<th>Name</th>
<th>URL</th>
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<tbody>
<tr>
<td>DSpace</td>
<td><a href="http://www.dspace.org">http://www.dspace.org</a></td>
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<tr>
<td>Digital Library software</td>
<td></td>
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<tr>
<td>KDE</td>
<td><a href="http://www.kde.org">http://www.kde.org</a></td>
</tr>
<tr>
<td>Unix desktop environment</td>
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<tr>
<td>Apache</td>
<td><a href="http://www.apache.org">http://www.apache.org</a></td>
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<tr>
<td>Web Server</td>
<td></td>
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<tr>
<td>FreeBSD</td>
<td><a href="http://www.freebsd.org">http://www.freebsd.org</a></td>
</tr>
<tr>
<td>Unix operating system</td>
<td></td>
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<tr>
<td>GIMP</td>
<td><a href="http://www.gnome.org">http://www.gnome.org</a></td>
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<tr>
<td>GNOME</td>
<td><a href="http://www.linux.org">http://www.linux.org</a></td>
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<tr>
<td>LINUX</td>
<td><a href="http://www.mozilla.org">http://www.mozilla.org</a></td>
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<tr>
<td>Mozilla web browser</td>
<td></td>
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<tr>
<td>My SQL</td>
<td><a href="http://www.mysql.org">http://www.mysql.org</a></td>
</tr>
<tr>
<td>Database</td>
<td></td>
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<tr>
<td>Project Gutenberg</td>
<td><a href="http://www.promo.net/pg.org">http://www.promo.net/pg.org</a></td>
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<tr>
<td>Freely available digital content (started 1971)</td>
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<tr>
<td>Open office</td>
<td><a href="http://www.openoffice.org">http://www.openoffice.org</a></td>
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<tr>
<td>Office application suite</td>
<td></td>
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<tr>
<td>PHP</td>
<td><a href="http://www.php.net">http://www.php.net</a></td>
</tr>
<tr>
<td>Os programming tool</td>
<td><a href="http://www.eprints.org">http://www.eprints.org</a></td>
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<tr>
<td>Eprints</td>
<td></td>
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<tr>
<td>Digital Library software</td>
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<tr>
<td>Greenstone</td>
<td><a href="http://www.greenstone.org">http://www.greenstone.org</a></td>
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**DSpace Architecture Descriptions**

<table>
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<tr>
<th>Sl. No.</th>
<th>Three Layer</th>
<th>Descriptions</th>
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<tbody>
<tr>
<td>1.</td>
<td>Application layer</td>
<td>The application layer covers the interface to the systems, the Web, the user, the interface and batch loader, in particular</td>
</tr>
<tr>
<td>2.</td>
<td>Business layer</td>
<td>The business layer is the DSpace specific functionality, workflow, content management, administration and search and browse modules happen</td>
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<tr>
<td>3.</td>
<td>Storage layer</td>
<td>The storage layer is implemented using the file system, as Managed by postgres SQL databases</td>
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**What can DSpace do?**

DSpace can manage and preserve all types of digital content.

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

- Institutional Repositories
- Learning Object
- E-thesis
- Electronic Record Management
- Digital Preservation
- Publishing, etc.

**DSpace Directories**

A complete DSpace installation consists of three separate directory trees. It is important to get a general understanding of the DSpace directories and the names by which they are generally referred.

**Source directory** (DSpace-source). This is the location where the DSpace release distribution is unzipped. It usually has the name of the archive that is expanded by the user such as dspace-<version>-<release>.

**Web development directory** (DSpace). This is the directory that contains DSpace web applications (s).

In DSpace 1.5.x and above, the directory of webs all by default. However, if you are using Tomcat, you may decide to copy your DSpace web applications from (dspace) /webapps/ to (tomcat)/webapps/ (with(tomcat) being wherever your installed Tomcat - also known as SCATALINA-HOME).

**Institutional Repository**

Institutional repository is a computerized system that systematically collects, digitizes, preserves and disseminates the intellectual output in digital form. The institutional repository is collecting, digitizing, organizing information generated by the laboratories across India in the form of various types of R&D reports.

We can store all types of content in a DSpace, such as

- **Academic publications**: articles (published articles in journals, magazines and newspapers, copyright approved post-print articles, pre-print materials related to published peer-reviewed articles), books, (including conference proceedings, and abstracts).
• **Theses and dissertations:** Doctoral theses, Masters Theses, and dissertations.

• **Grey literature:** patents (published only), technical reports, software, project reports, internet, publication, documentation and manuals, working and discussion papers, non peer-reviewed, conference and workshop materials ( posters and speech/lecture materials)

• **Audio-visual items:** images, shows/exhibitions, lecture, etc.

• **What training does the librarian need for this?**

  Librarian must be well-equipped with handling the latest software available pertaining to his/her discipline.

• **How is the system foolproof?**

  In DSpace all the passwords are encrypted. There are no other access restrictions which can be implemented in DSpace. The database in DSpace is stored in postgresql where postgresql has username and password DSpace database. The details of each users logging is saved in DSpace. cefg file. End user cannot get access to database schema unless he has login and password of postgresQL database. Only system administration can access database schema.

**Faculty engagement**

There are several ways to describe the value of an institutional repository to the faculty who will contribute material, and the administration that will support the effort. And it is critical to explain those benefits, and to market the service, to both constituencies.

The Libraries provide guidance in establishing new Communities, and assistance to faculty and others in using the system. DSpace was envisioned by the MIT Libraries as a continuation of their mission to collect, make available, and preserve important scholarly material of all kinds, especially that of MIT’s own faculty and research community. The Libraries are working to extend their services in the digital era, to reflect current trends in scholarly communication and education, and to offer new means of distributing research material that are enabled by network technology.

Over the past few years MIT has been placing new emphasis on educational technology with initiatives such as OpenCourseWare and Open Knowledge Initiative. Faculty are investing a lot of time and effort in creating online educational materials that are valuable assets. DSpace is collaborating with the major educational technology initiatives at the Institute, including OpenCourseWare, so that storing, relocating, reusing and repurposing course content becomes reliable and easy.

Faculty accustomed to finding documents online, whether published or pre-publication, expect to continue to work with discipline-defined collections. DSpace can store and deliver preprints and eprints from the host institution and could support virtual collections from different academic disciplines by means of federation across large numbers of participating institutions. Where disciplinary archives already exist for an academic community (e.g., the arXiv system at Cornell University) DSpace could be made to automatically submit copies of relevant documents to these centralized archives during the local deposit process.

**Benefits of using DSpace in Digital Library**

DSpace is a turnkey repository application it may be deployed “out-of-the-box” as an institutional repository. The majority of DSpace users do little to no customization of the application beyond adding local branding. DSpace allows to:

- Organize, describe and store your content easily through the built-in structure
- Archive and distribute material you would currently put on your personal website
- Get your materials out quickly, to a worldwide audience through exposure to search engines such as Google
- Have a persistent network identifier for your work, which never changes or breaks

Additionally, DSpace allows institutional repositories to:

- Preserve reusable teaching materials that you can use with course management systems
- Store examples of students’ projects (with the students’ permission)
- Showcase students’ theses (again with permission)
- Keep track of your own publications/bibliography

**Conclusion**

Library is the heart of any institute or organization. Digital libraries are very important platform of structured well-organized and well-stored information. Library is a non-profit organization.

DSpace is open source digital library software that provides facility to organize all types of content in digital format. It provide access facility for a particular document in a different way like, Author search, Title search, subject search, and date of submission.

The aim of DSpace at MIT, and at a growing number of other institutions, is to create research material in many forms visibly available. Though beneficial, DSpace is still not being used in many libraries. It still needs considerable efforts to
find incentives for faculty to participate and work with publishers and government regulators to ensure that software like DSpace continue to be allowed. A step forward in this direction would be to get more institutions involved to work together.

References


5. DSpace: Retrieved From: http://www.Dspace.org/

