Open Source Software (OSS) for Creation of Digital Library Repositories

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ABSTRACT: *Now days organizations cannot think of doing their tasks effectively and efficiently without software. The extremely competitive environment, zero deficiency and enhanced productivity has made it mandatory for the organizations to carefully choose the appropriate software after comprehensive needs assessment. Software simply their tasks and saves a lot of precious time which can be utilized in managing other important issues. Libraries also need softwares if they want to create a parallel digital library with features which we may not find in a traditional library. There are several open source softwares available to create a digital library repository. For this, firstly the library professionals should be aware of the advantages of open source software and should involve in their development. They should have basic knowledge about the selection, installation and maintenance. Open source software requires a greater degree of computing responsibility than commercial software. Digitization involves huge money to create and maintain and the OSS appears to be a means to reduce it. Among these, DSpace and Greenstone are becoming more popular in India and abroad. This paper deals with the open source softwares, Advantages of Open Source Software, Desirable features of DL Software and Digital repository created by OSS in India.*

Keywords: Open Source Software, Digital Library Repositories

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1. Introduction

Libraries do not have huge amounts of money to experiment, and they don't usually purchase additional resources. The need

for software, its installation, training and the lack of money available to spend on it have forced many libraries to stand for themselves when it comes to staying up to date with the latest technology. Unless, of course, they adopt the open source movement and use a few of them available to overcome these problems. Most software that we all use everyday is known as "proprietary", which means that it costs money and that the actual code of the software is restricted, in that the code of the software cannot be modified, copied, or changed from its original construction. The code is "unreadable" and pretty much is what it is. Open source software (OSS), on the other hand, is quite the opposite. The open source mentality revolves around sharing and collaboration, and these two important elements describe open source software perfectly. First and foremost, open source software is free for anyone to have; more importantly, not only is the software free, but it is also free for anyone to copy, hack, modify, etc. This increases the possibilities of a software program's potential because of this freethinking model. There are many different kinds of open source software solutions out there today that could be embraced by the library.

1.1. Digital Library

Edward Fox stated, Digital Library is an assemble of digital computer, storage and communication machinery togather with the context and software, needed to produce, emulate and extend those services provided by conventional libraries based on paper and other materials means of collecting cataloguing and finding and disseminating information. A full service digital library must accomplish all essential services of traditional libraries and also exploit the well known advantages of digital storage, searching and communication.

Digital libraries are defined in many ways, encompassing both analog material made available digitally and newly created digital content. It is an organized searchable collection in digital format. There are quite a few digital library software packages available in the market. Open source digital library software derives its strength from several enabling technology and metadata based inter operability protocols, which have become available recently.

1.2. Open Source Software (OSS)

Open source software is computer software whose source code is available under a license that permits users to study, change, and improve the software, and to redistribute it in modified or unmodified firm. It is often developed in a public, collaborative manner. It is the most prominent example of open source development and often compared to user generated content.

1.3. Usage of Open Source Software

Open source software 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

2. Advantages of Open Source Software

- The availability of the source code and the right to modify it is very important as enables in the improvement and extend the lifetime of a software product.
- Source code availability also makes it much easier to identify errors, and to fix them.
- The right to redistribute modifications and improvements to the code, and to reuse other open source code, permits all the advantages due to the modifiability of the software to be shared by large communities.
- Continuous improvement does not require users to pay for it. There is no single entity on which the future of the software depends. This is a very common concern with proprietary software.
- There are fewer conflicting priorities due to marketing pressures. Usually open source software is delivered "when it is ready", and when the development team feels that its quality is good enough. This means that software usually does not need as many "service packs", updates and such, reducing the maintenance cost.
- It provides a new forum for democratic action, collaboration, mutual benefit without geographical or any other barrier/bias.
- It forces commercial software vendors to keep their product price at a reasonable level.

2.1. Desirable features of DL Software

- Peer to Peer Architecture
- Modularity and application Program Interface (API)
- Scalable database back-end
- Unicode compliant (for Multi-lingual resource)
- Open Source Components
- Open Standards
- Submission facility
- Review work flow
- Persistent identifiers
- Easy administration
- Security
- Integration with existing home pages
- Customization
- Choice for Licensing Practices
- Authentication

2.2. Selected Examples of OSS on Digital library

Some selected DLs software which are using by different organization are given below

- **Greenstone**

Greenstone is a suite of software tools for building and distributing digital library collections on the Internet or CD-ROM. It is open-source, multilingual software, issued under the terms of the GNU General Public License. Greenstone is produced by

the New Zealand Digital Library Project at the University of Waikato, and has been developed and distributed in cooperation with UNESCO and the Human Info NGO in Belgium. It is open –source multilingual software, with user interface, search browsing , eassy customization and issued under the terms of the GNU General Public Licence. (http:// www.greenstone.org).

• **DSpace**

DSpace is an open source repository software package typically used for creating open access repositories for scholarly and/ or published digital content. While DSpace shares some feature overlap with content management systems and document management systems, the DSpace repository software serves a specific need as a digital archives system, focused on the long-term storage, access and preservation of digital content. The first public version of DSpace was released in November 2002, as a joint effort between developers from MIT and HP Labs.[1] Following the first user group meeting in March 2004, a group of interested institutions formed the DSpace Federation, which determined the governance of future software development by adopting the Apache Foundation's community development model as well establishing the DSpace Committer Group. In July 2007 as the DSpace user community grew larger, HP and MIT jointly formed the DSpace Foundation, a not-for-profit organization that provided leadership and support. In May 2009 collaboration on related projects and growing synergies between the DSpace Foundation and the Fedora Commons organization led to the joining of the two organizations to pursue their common mission in a not-for-profit called DuraSpace. Currently the DSpace software and user community receives leadership and guidance from DuraSpace.

• **Eprints**

Eprints is generic archive software under development by the University of Sothampton. It is intended to create a highly configurable web-based archive. Eprints primery goal is to be set up as an open archive for research papers, but it could be easily used for other things such as image, research data, audio archives – anything that can be stored digitally by making changes in configuration. It works on Linux operating system and it needs MySQL, Perl modules and Apache webserver. (http:/ /www.eprints.org.)

• **Fedora**

Fedora was designed on the principle that interoperability and extensibility is best achieved by architecting a clean and modular separation of data, interfaces and mechanisms (i.e. executable programs). With Cornell's Digital Library Research Group's help, the University of Virginia Library team installed the research software version of Fedora and began experimenting with some of Virginia's digital collections. The prototype provided strong evidence that the Fedora architecture could indeed to be the foundation for practical, scalable digital library system. The current version of Fedora is 2.1. (http:// www.fedora.info/)

• **CDSWare**

The CERN Document server software (CDSware) is the software developed by and maintained by and used at the CERN Document server. It complies with the Open archives Intitiative metadata harvesting protocol (OAI-PMH) and uses MARC 21 as its underlying bibliographic standard. (http://cdsware.cern.ch/)

• **Dienst**

Dienst is a system for configuring a set of individual services running on distributed servers to corporate in providing the services of a digital library. It has been written in PERL. It works more comfortably on Unix / Linux run web servers. (http:// www.cs.cornell.edu/cdlrg/dienst/software/Dienstsoftware.htm)

2.3. Digital Repository Created by OSS in India

The following institution created digital repository by Using Dspace Software;

• **Indian National Science Academy (INSA):** INSA has created a digital repository for the publication of INSA and its members.

• **National Chemical Laboratory (NCL):** NCL repository collects, preserves and disseminates in digital format the research output created by the NCL research community.

• **ETD@IISc:** This is the digital repository of theses and dissertations of Indian Institute of science, Bangalore, India. It

complements ePrints@IISc, the research publications repository of IISc.

• **IIT Delhi:** This is a digital repository of Indian Institute of Technology Delhi research and electronic submission of Theses and Dissertations [ETD]. There is another digital collection at Eprints@Cental Library, IIT Delhi.

• **University of Hydrabad:** This is digital repository of University of Hydrabad for its different departments.

• **Librarian's Digital Library[LDL]:** This library has developed by DRTC, which contains full text of papers / articles related to Indian library and librarianship. Presently it contains full text papers submitted in DRTC seminars, papers submitted by LIS professionals and students theses / dissertations. In future it is having plan to include conference proceedings of Indian LIS association.

• **Vidyanidhi:** It is planning to develop repository for Indian doctoral thesis. At present it provides access to metadata of Indian thesis. The project is based at Department of Library and Information Science, Mysore University, Mysore.

The following institutions created digital repository by using Greenstone digital library software (GSDL)

• **Archive of Indian Labour:** A collaborative project between the V.V. Giri National Labour Institute and the Association of Indian Labour Historians. The archives of Indian Labour are dedicated to preserving and making accessible the fast depleting documents on the Indian working class.

• **Indian Institute of Management, Kozhikode:** The center for Development of Digital Libraries of the Indian Institute of Management (IIMK), Kozhikode uses GSDL software for its digital library collection development.

• **Documentation research and training Center (DRTC):** It contains full text papers submitted in DRTC seminars, workshop and conference.

• **Indian Institute of Science Publication Database, Bangalore:** The database is web enabled.

• **NCSI Demonstration collections :** Demonstration collections created by students and staff at the National Center for Science Information, Indian Institute of Science, Bangalore. Many of these collections include content in Kannada and Hindi.

3. Conclusion

Digital libraries are a key technology for developing countries. They can assist human development by providing a non-commercial mechanism for distributing humanitarian information on topics such as health, agriculture, nutrition, hygiene, sanitation and water supply. Many other areas, ranging from disaster relief to medical education, also benefit from new methods of information distribution. Digital library can be created by using open source software available free of cost. Free and open-source software are not only "a useful and significant tool for the developing countries", but clearly have the potential to help democratization and help find solutions to the most pressing problems faced by the populations of developing countries. Greenstone and DSpace are appropriate software for creating digital libraries with minor variation in the features and workflows. Greenstone and DSpace digital library software can be used for serving the people, society, nation and the world at large.

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