

OPEN SOURCE SOFTWARE FOR LIBRARIES WITH SPECIAL REFERENCE TO INDIA

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Abstract

The paper, while giving the introduction of the concept, describes the Open Source Software (OSS) and explains the meaning of the term OSS, giving some of the definitions, the typical terms used to explain it and also elaborates some of the important issues with reference to the explanation of the OSS. It discusses the reasons why the librarians and the libraries need the OSS model in current scenario, same. It further discusses in details, the important issues of OSS development and librarianship and Open-Source and Usability. The paper enumerates the important characteristics of the OSS and the criterion for selection of correct OSS as per the individual requirements. It describes important OSS, being presently used worldwide with special reference to the popular OSS used in Indian library environment, highlighting important characteristics/features, merits, etc. of the software's. critical issues and challenges in OSS environment are also discussed. The paper further highlights the future of the OSS and concludes with an assessment of widely used OSS.

Keyword: Open Source Software (OSS), Indian library.

1.0 Introduction:

Open-source software (OSS) is software for which the source code is freely available for anyone to see and manipulate. There are various licensing models to which the OSS label has been applied, but the basic idea is that the software's "license may not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs" and the working software must either be distributed along with its source code or have a "well-publicized means of downloading the source code, without charge, via the Internet." That is, anyone can access and manipulate the code that was used to write a program, as long as anything that person comes up with using that code is also offered to the public as OSS. This allows those who use the software to contribute to its further development fix bugs and tinker with it as they please. This is contrasted with proprietary software, which is distributed as compiled object code or machine code, leaving the source code solely under the control of the individual software vendor Open source software has become a trendsetter in the arena of software development and distribution. The development of open source software was a reaction to the existing legal instrument on software copyright from the software developer's community. Open source software's are available free of cost and users have the freedom to run and distribute the software without any restriction. Normally small and medium size libraries feel automation of housekeeping operations as a financial burden due to the high price of Library Management Systems (ILS). Development of open source software gives effective way to create digital library operations without financial investment.



Figure 1: Official Open Source Logo

2.0 What is Open-source software?

OSS are computer programs in which the source code is made available to the general public for use and/or modification from its original design free of charge, i.e. open. Open source programs are typically created as a collaborative effort in which programmers offer the user a flexibility of use and share the changes within the community. A certification standard is issued by the Open Source Initiative that indicates that the source code of a computer program is made available free of charge to the general public. The rationale for this movement is that a larger group of programmers not concerned with proprietary ownership or financial gain will produce a more useful and bug free product for everyone to use. The concept relies on peer review to find and eliminate bugs in the program code, a process which commercially developed and packaged programmes do not utilize. Programmers on the Internet read redistribute and modify the source code, forcing an expedient evolution of the product. The process of eliminating bugs and improving the software happens at a much quicker rate as the information is shared through the open source community. The term 'software' refers to two different but related things; Source code: a set of human readable and understandable instructions that comprise the 'recipe' from which an executable program can be made and Object code: the actual executable program which is compiled of machine readable source code. It is fed into a computer's microprocessor to perform various operations. The advocates of what we think of as the open source movements add further conditions (Hasan)

2.1 Benefits of using Open Source Software:

Librarians/Professionals are now considering OSS because of its low purchase costs. There is no initial purchase fees, or upgrade fees. A user can access form anywhere, anytime provided he has access to the necessary infrastructure. Information can be shared more easily. Open source software it is possible to incorporate the software into another program to perform new function.

2.2 Loss of Using open source Software:

OSS also faces many risks. Especially for long term use which in any case of prime concern for any library OSS has great risk. Given below are some of the risk factors involved which open source software use.

- No Guarantee of Continuity
- No Guarantee of updates
- Unavailability of physical support for installation and troubleshooting.(KhayyumBaba)

2.3 Criteria for Selection and Evaluation of OSS

Important points should be taken into consideration while choosing an OSS are:

- ✚ Reputation of the software
- ✚ Monitor ongoing efforts and local usability
- ✚ Support for Standards and Interoperability
- ✚ User support
- ✚ Discussion Forums
- ✚ Check versions, documentation available for the software
- ✚ Skills of the workers
- ✚ Availability and conditions of the license and the hidden cost involve
- ✚ Commercial support for operability, etc.

3.0 Why Open Source Model for Librarians/ Libraries?

The basic idea behind open source is very simple; when programmers can read, redistribute, and modify the source code for a piece of software, the software evolves. People improve it, people adapt it and people fix bugs. And this can happen at a speed that, if one is used to the slow pace of conventional software development, seems astonishing. OSS also helps in taking care of severe budget cuts, increased demand for services, lack of adequate staffing, etc. The open source model offers librarians, the capability to create the software that we have always wanted - standards

compliant, interoperable, extensible and scalable software that does what we want it to do: help customers find information quickly, conveniently, no matter where that information resides. To choose open source because it gives you the freedom to use, change or distribute the way you want. Remember, libraries are expected to stay much longer than the vendors. Vendors may not support a version which they sold you some time ago. Or they may go out of business. In that case, all your work and investment go waste. You may be forced to migrate to another version or software. With Open Source, you know what it all contains. You may tweak it yourself or hire people to do so, but then it is always with you. You can make it to evolve for your library's evolving needs.

4.0 OSS Development and Librarianship

Both OSS development and librarianship put a premium on open access. Both camps hope that the shared information will be used to improve our place in the world. Human interactions are a necessary part of the mix. Open source development requires an understanding of the problem, the computer application is trying to solve, and the maintainer must assimilate patches with the application. While databases and many "digital libraries" house information, these collections are really "data stores" until the data is given value and put to use whereby the stores become libraries. It has been stated that open source development will remove the necessity for programmers. Ironically, librarianship is flowering under new rubrics such as information architects and knowledge managers. Both institutions use peer review, a process where "given enough eyeballs all bugs are shallow". National Research Centre for Free/Open Source Software (NRC-FOSS) aims to contribute to the growth of FOSS in India through Research and Development, Human Resource Development, Networking and Entrepreneurship Development, as well as serve as the reference point for all FOSS related activities in the country including the creation and maintenance of this national FOSS Portal. Open Source Software Repository (Source Forge) – www.SourceForge.net is the world's largest Open Source software development web site. SourceForge.net provides free hosting to Open Source software development projects with a centralized resource for managing projects, issues, communications and code. UNESCO's Free and Open Source Software Portal - A gateway to resources related to Free Software and Open Source Technology movement is another milestone. (Hasan)

5.0 Open-Source and Usability

The problems if we observe, are typical of usability issues that frustrate novice users. Many of the identified issues are present in the software and documentation for some considerable time. The central mechanism for achieving software quality in open-source projects is extensive beta-testing. This 'bazaar-style' of development successfully encourages extensive functional testing of error-prone software's to produce robust and reliable software such as the Apache web server. However, elements of usability may not be equally well-supported by open source development - particularly when applied to software aimed at less technically-sophisticated users.

5.1 Characteristics

OSS has many characteristics. the important ones are:

- ❖ It is generally acquired freely
- ❖ Manufacturer or developer has no right to claim royalties on the distribution or use
- ❖ Source code is accessible to the user and distributed with the software
- ❖ No denial to an individual or to a group to access source code of the software
- ❖ It has provision of modifications and derivations under the programmer's original name
- ❖ Rights of facilities attached to the programme must not depend on the programme's being part of a particular software distribution
- ❖ Licensed software cannot place restriction on other software that is distributed with it
- ❖ Distribution of License should not be specific to a product and License should be technology neutral, etc.

6.0 Some of the popular OSS for Library and Information Management with special reference to India

NewGenLib: NewGenLib, an integrated LMS is open source under the most widely used free software license, GNU GPL. NewGenLib is the result of collaboration between specialists in library automation and software

specialists. The software was developed over a four-year joint effort between a professional charitable trust, Kesavan Institute of Information and Knowledge Management (KIKM) and a fledgling software development company. Libraries in India still do not generally use international metadata and interoperability standards (e.g., MARC-21, Dublin Core, OAI-PMH) and it is believed that this puts them at a great disadvantage when it comes to sharing metadata and building union catalogues and networking. The fact that libraries are not networked and hence are handicapped in sharing costly bibliographic and full-text resources among themselves, the importance of providing software that would allow both library management and the creation of institutional open access repositories increases.

6.1 Koha : (www.koha.org) Koha is a promising full featured open source integrated library system (ILS) created in 1999 by Katipo Communications for the Horowhenua Library Trust in New Zealand, and currently being used by thousands of libraries all over the world. It includes modules for circulation, cataloging, acquisitions, serials, reserves, patron management, branch relationships, and more. Koha has web-based Interfaces. Koha is built using library ILS standards and uses the OPAC (online public access catalog) interface. In addition, Koha has no vendor-lock in, so libraries can receive technical support from any party from they want. It is distributed under the free open source general public license (GPL). It supports MARC 21 and UNIMARC support, Z39.50. It also has a provision for online reservations and renewals.(Kamble)

6.2 Greenstone: (www.greenstone.org) has been developed by the New Zealand Digital Library Project at the University of Waikato, and is distributed in cooperation with UNESCO and the Human Info NGO. Greenstone is a tool for building libraries that aims to empower users— particularly those in, universities, libraries, and other public service institutions—to build large distributed digital library collections. The current installed base, is unknown, but the number of downloads of the software appears to be large. It is an open source software that can handle multilingual documents, and has a search and browse facility under GNU General Public License Greenstone is a tool for creating and managing digital library collections. It runs on Windows as well as UNIX. The Greenstone digital library software builds collections with effective full-text searching and metadata-based browsing facilities that are attractive and easy to use. Moreover, they are easily maintained and can be augmented and rebuilt automatically. The system is extensible: software ‘plugins’ accommodate different document and metadata types.

6.3 D Space: (www.dspace.org) Massachusetts Institute of Technology (MIT) and Hewlett-Packard (HP) have jointly created DSpace software as a digital repository to manage intellectual, output of multidisciplinary research and development organizations. DSpace supports digital preservations and planning and managing institutional repository in a large institution. It also allows workflow and customization and supports community/ collection-based content and submission by different user communities. It is based on a three-layered architecture, namely application layer, business layer, and 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 lie 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 PostgreSQL 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, which are, in turn, composed of one or more bit streams, or physical files of digital materials. DSpace item is a single bit stream. For example, a digital image encoded as a TIFF file or a digital document encoded as a PDF file. It is a groundbreaking digital institutional repository that captures, stores, indexes, preserves, and redistributes the intellectual output of a university’s research faculty in digital formats. It manages and distributes digital items made up of digital files (or bit streams), and allows the creation, indexing, and searching of associated metadata to locate and retrieve the items. DSpace also supports submission, management, and access of digital content..

6.4 EPrints: (www.eprints.org) is a generic archive developed by the University of Southampton. The first version of the software was publicly released in late 2000. The objective behind the creation of EPrints was to facilitate open access to peer-reviewed research and scholarly literature through OAI. However, EPrints also serves as an archive for other electronic documents such as images and audio EPrints is intended to create a highly configurable Web-based archive. Its primary goal is to be an open archive for research papers, but it could be easily used for other things such as images, research data, and audio archives— in fact, anything that can be stored digitally by making

changes in configuration. It works on Linux and needs MySQL, Perl modules and Apache Web server. The software can be installed by any institution across the world. By its integrated advanced search, extended metadata, and other features, the software can be customized to meet local requirements.

6.5 Fedora: (www.fedora.info) has been jointly developed by the University of Virginia and Cornell University. Its first version was released in 2003. The objective of Fedora 1.0 was to create a production quality system using XML and Web services to deliver digital content. Fedora supports digital asset management, institutional repositories, digital archives, content management systems, scholarly publishing enterprises, and digital libraries. The system is designed to be a foundation upon which full featured institutional repositories and other interoperable Web-based digital libraries can be built. It currently has a distributed installed base of more than 360, with collection sizes of 10 million objects. As open source software, Fedora offers organizations a flexible service-oriented architecture for managing and delivering digital content. At its core lies a powerful digital object model that supports multiple views of each digital object and the relationships among digital objects. All functions of Fedora, both at the object and repository level, are revealed as Web services. These functions can be protected with fine-grained access control policies. This unique combination of features makes Fedora an attractive solution in a variety of domains. Some examples of applications that are built upon Fedora include library collections management, multimedia authoring systems, archival repositories, institutional repositories, and digital libraries for education.

6.6 Ganesha: Ganesha Digital Library (GDL) enables institutions or persons to share their knowledge as well as simultaneously access and utilize knowledge. GDL is a tool for managing and distributing digital collection using web-based technology. GDL utilizes Indonesia DLN Metadata Standard that is based on Dublin Core metadata standard. It opens possibilities of information exchange with other systems on the Internet that also utilize Dublin Core. Data transaction between client and server within GDL-Network using XML format is allowed. It makes possible for further development of GDL to become more extensive web-based networking application in the future.

6.7 CERN: CERN Document Server Software (CDSWare) is an integrated digital library management system which provides the framework and tools for building and managing an autonomous digital library server. It covers all aspects of digital library management and complies with the Open Initiative Metadata Harvesting Protocol (OAI-PMH) and uses MARC21. Its flexibility and performance make it a comprehensive solution for the management of document repositories of moderate to large size libraries.

6.8 CDS/ISIS for Windows: This is the most widely used software for Indian libraries, available freely from the UNESCO website. It has all the features of a complete Integrated Library Management Software and the support for this software is available locally as well as a number of professionals are trained in its use. It also has a very strong base for international discussion forum. Truly speaking, most of the libraries in India started computerizing their cataloguing activities with this software only and later on shifted to other commercially available software's and OSS.

6.9 Open Source is the Difference

Open source has been a buzzword in the library community for several years now. We have heard the hype: open-source software is free, more reliable, more secure, boasts faster development cycles, and is just plain cooler than proprietary software. Here are just a few of the reasons why open source is an especially attractive solution for libraries. Open-source software is free; the library will pay only for the product support and training (if any) that it may need. Software functions are paid for only once making open source software extremely cost-efficient. Libraries using open-source software benefit from many advanced technology solutions that they otherwise could not afford to develop themselves yet they still have the option to steer development if they so desire. Open source empowers libraries to be innovative and collaborate. Not only can they download and use open source software for free, they are free to alter it in any way they deem fit, provided the results are redistributed for free.

7.0 Choosing Support

In a proprietary software development model, one pays high license fees to use the software. If the vendor is not providing with adequate support or is not allowing client the freedom to customize and improve the software to meet their needs, switching vendors means switching software. And then there is the matter of shifting the data from one

vendor to the next: with open-source software, since all one is paying for is support, switching to another service provider or migrating to an in-house solution is simple. Further, an open-source software development model means unique identity and property of data.

8.0 The Future is Open source in libraries

Open source in libraries has its challenges as well. Till now, library software vendors have built their businesses around a proprietary software development model, and, as a result, libraries have been slow to adopt open source. Many libraries simply do not have the in-house expertise to support open-source software development, and also don't have the ability to train their staff on the use of new technologies. Open source is here. It's growing. Anyone can be a part of it. (Hasan)

9.0 Conclusion

The Open Archives Initiative (OAI) has gained momentum since eprints.org was released in 2000. OSS incorporates an interface that makes it easy for people to create their own library collections. Collections may be built and served locally from the user's own web server, or remotely on a shared digital library host. End users can easily build new collections styled after existing ones from material on the web or from their local files (or both), and collections can be updated and new ones brought online at any time. OSS has much potential for libraries and information centers, and there are numerous projects, including Koha, NewGenLib, Greenstone, DSpace, Ganesha, etc. that demonstrate its viability in this context. It gives library staff an option to be actively involved in development projects, and this involvement can take many forms, such as reporting bugs, suggesting enhancements and testing new versions. Currently available OSS projects cover application areas ranging from the traditional library management systems to innovations like Greenstone and DSpace, which complement traditional systems. DSpace, EPrints, Greenstone and KOHA are among the top most OSS which are widely used in India and world over because of flexible searching, browsing, phrases and almost zero maintenance features. These concepts and their benefits and importance to libraries should be examined and explored for the wider audience and prospects for long-term preservation of scholarly works. The management and parent organization never stop if a good proposal with time bound implementation is put for financial approval. Government of India has allocated Rs. 23000 crore for e-Governance during 11th Plan. Many of the organizations are not able to spend their ICT budgets or sometime manage to spend somehow. Community backed software's are the answer for long term continuity and continuous updates. These are nothing else but Open Source Software's which are developed and maintained by 'community spirit'. Since communities last longer than individuals and businesses, the open source software's backed by strong communities last much longer. The community spirit does wonders and cannot be explained in simple business models – but it works! Well, who owned Internet anyway? How Wikipedia came to a level that it could be compared with Encyclopaedia Britannica. How Linux keeps itself going? And what is this Web 2.0? What the hell makes sites like Facebook / Orkut (and many others) so popular. Well, there is this 'community spirit' in every such wonder. If youngsters are following this; follow the advice – go for Open Source Software's.

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