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OPEN SOURCE SOFTWARE AND ITS APPLICATION IN LIBRARIES : A STUDY AMONG THE LIBRARY USERS

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ABSTRACT

The quick growth and evolution of software world in libraries have changed the general traditions of the developing libraries. Furthermore it has changed the functionality of the libraries and there management by the librarians. The developments of the libraries with a heavy demand of finance have forced the emergent of open source softwares in libraries, where everything is easier and faster when compared to the usual method. Now the emphasis is on the awareness of the open source softwares available in the internet and web. The dissertation introduces librarians to using open source software and provides tips for implementing and evaluating their transition, ideas for funding, and suggestions for open source softwares to use in their library.

Most studies of open source software evolution have been conducted on open source system developed within a single company using traditional management techniques. With the widespread availability of several large software systems that have been developed using an "open source" development approach, we now examine these systems in detail, and see if their evolutionary narratives are significantly different from commercially developed softwares. This study summarizes a preliminary investigation into the awareness of the best known open source softwares.

Keywords: Open Source Softwares, Library, Librarians, DLMS, ILMS

Introduction

The evolution of softwares started in 1970s, before which software were known by only programmers or the software developers. As new industries and institutes started sharing their data and information through internet, software began to become necessary for the cooperative world existence. Then the era came when softwares were commercialized and that is from 1970s to 1980s. Richard Stallman, the first person to introduce free software into the field of computing, who was also a software developer for MIT's Artificial Intelligence Lab in the 1970s-1980s. Later on Richard Stallman choose to leave his job as he was more interested in developing the Free Software Foundation.

The availability of source code with the software came into existence in 1998, when Netscape declared release of source code as an advantage to its web browsers. Then a conference was held in Palo Alto, California as a conclusion to this major step then by Netscape. The open source initiative was proposed by Eric Raymond and Christine Peterson, who were also present at the conference. As time went on people started knowing the benefits and profits of using open source software, due to which many more open source softwares also came into the field of computing.

The advantages of open source software is that it is not bounded, instead have many freedoms associated with it. Some of the freedoms are: freedom of accessing, freedom of modifying and updating, freedom of source code availability, freedom of redistribution, freedom of using many types of software at one place at a time. Open source software is available free of cost, except for some maintenance charges which is very low and affordable. It has some licensed conditions associated with it, which are even included with the modified versions. The implementation, maintenance, usage, installation, etc, of open source software are very easy, that is the only reason people started using OSS very frequently. The main agenda of open source software is that it is open to everyone without any discrimination, and is manipulated when it does not live up to the software expectations and is accessible from any corner of the world.

The phenomenon of open source software have very important role in libraries and management world today. Thousands of libraries worldwide use open source software to make there library collection socially available by putting it on web through digital library. It is an aid to the libraries that have just come into existence, and which cannot afford to buy such costly softwares available in markets now a day. After putting the collected library on to the web we can access it from anywhere in the world, which is an advantage to portability problem. Open source software helps the librarians to create a library where retrieval and understanding of information is faster than the usual way. Finally there should be user and staff satisfaction after creation of a library, and if this aim is not achieved then there should be re-evaluation of the collected library information.

Objectives of the Study

The present study has been undertaken with the following objectives:

i. To study the different types of open source software.
ii. To determine the frequency of using open source software.
iii. To study the various purpose of using open source software including digital library software.
iv. To assess the satisfaction level of the users in using open source software.
v. To introduce awareness among the librarians about new open source software.
vi. To make a report on advantages of open source software over commercial software.

Relation of the Study

Former president **APJ Abdul Kalam** stated that "*open-source software offers developing nations such as India the best opportunity to modernize*". According to him open source softwares have become the backbones of the today's libraries. Due to the increasing prices of books, articles, journals, etc. librarians are looking for alternative ways to come out of shrinking budget problems, so that they provide sufficient results to the users. Open source softwares have made it possible for them to tackle this problem, where information storing, collecting, arranging and accessing is rather faster than as usual. Even the librarians show a great interest in using open source softwares in their libraries as it is easy to use and helps them keep updated.

Crowston and Howison (2005) mentioned in their study about the popularity gained by open source software through internet and the widespread of awareness about the open sources available online. The main purpose was to distribute knowledge among the people about the upcoming of open source softwares. The introductions of open sources were made with a common goal of satisfying customer's needs.

Lee and Cole (2003) stated open source software as a revolution towards the software development and it is a great innovation to the organizational production.

According to them the main characteristics of open source software development are:

- Open membership.
- Community based.
- Motivations and encouragement for employees.
- Distributary work for members.
- Platform for knowledge creation.
- Many-to-many network communication technology.

Livari (2009) in her empirical report studied the participation of user in an open source software development and its profit towards users. She stated that it is an "*informative, consultative and participative roles for users".*

Definitions of OSS

According to **Berts** "Open source software is computer software with its source code made available and licensed with an open source license in which the copyright holder provides the rights to study, change and distribute the software for free to anyone and for any purpose".

Biswas and Paul define "Open-source software (OSS) is software for which the source code is freely available for anyone to see and manipulate. Open source softwares are available free of cost and users have the freedom to run and distribute the software without any restriction".

Peeling and Satchell define "Open Source Software (OSS) is software whose source code is openly published, which is usually available at no charge, and which is often developed by voluntary efforts".

Ten conditionds to be named OSS

i. **Free redistribution**: Redistribution of the software is possible which prohibits royalty claim and the selling of the software i.e. it has to be free of cost. Redistribution can be done after modifying it with the help of different sources.

ii. **Source code**: Source code must be available with the software. If it is not with the software then there should be an easy method to find the source code, for which reproduction charge could be cost.

iii. **Derived works**: Software modification and creation of the updated version should be allowed. The manipulated version should have the same terms and conditions with its license.

iv. **Integrity of author's source code**: Author's source code protection is also a requirement. The source code of the modified software must also be available.

v. **No discrimination against persons / groups**: The rules and regulations should be equal for everyone. There should not be any discrimination for any person or group of people.

vi. **No discrimination against fields of endeavor**: There must not be any restriction on using any other program or software from any other field, with the same conditions of license.

vii. **Distribution of license**: The modification of the software is possible, but modification such as additional or cancellation of rules in license is not entertained.

viii. **License must not be specific to a product**: The rules for the licensing should be autonomous i.e. common and equal for all, even if it is a modified one.

ix. **License must not restrict other**: There must not be any restrictions to the software distributed along with the open source software.

x. **License must be technology-neutral**: License should not be based on a specific interface or particular technology. License agreements must be free to use any technology or an interface.

Digital Library Management Softwares

It is a library where the information and collections are stored in digital format. It is an information retrieval system, where information can be stored locally or in the web for accessing it via computer networking.

i. **DSpace**

DSpace is open source digital library software developed by MIT libraries and HP labs together. DSpace provides tools for management of digital assets and is commonly used for building institutional repositories. It was basically designed to manage, host, preserve and enable distribution of the scholarly output of MIT's faculty. Currently over 250 organizations in 42 countries are using DSpace.

DSpace stores your data in any format i.e. in text, video, audio, and data. DSpace distributes the captured information over the web. It indexes your work, so users can

search and retrieve your items more easily. It preserves your digital work over the long term. DSpace provides a way to manage your research materials and publications in a professionally maintained repository to give them greater visibility and accessibility

Some of the irresistible features of DSpace are as follows:

a. Installation and maintenance procedure (backup, recovery, import, update, management, etc.) are explicitly done and are conducted very easily.
b. Capability of integration with other information systems is faster.
c. More structured and therefore long term preservation of data is possible.
d. DSpace provides more secured and flexible data model, when compared with other softwares.
e. Customizing and managing is more developed than any other package available.

ii. **Greenstone**

Greenstone began in 1995 with a small group of people who wanted to make on-line technical reports more accessible to the research community by presenting them over the Web in a uniform, and fully-searchable, way. **Greenstone is open source digital library software that is an advantage to people who want to build library software on their own, which is future reusable and redistributable.** Greenstone helps to rebuild a new library collection from the already existing libraries, instead of starting from the scratch, which is even a matter of time management in this fast growing technological world, where everything is done quickly.

Following are some of the sticking features of Greenstone Digital Library Software:

a. It is accessible via any web browser. The browser is used for both local and remote access.
b. Collection runs on both Windows (3.1/3.11, 95/98, NT/2000) or UNIX (Linux, SunOS, OS/X).
c. The user can browse lists of authors, lists of titles, lists of dates, hierarchical classification structures, and so on. Different collections offer different browsing facilities.
d. Searching and browsing structures are built directly from the documents themselves, no links are inserted by hand. Existing hypertext links in the original documents, leading both within and outside the collection, are preserved.
e. Unicode is used throughout the software, allowing any language to be processed in a consistent manner, and searched properly. A “language identification” plugin allows automatic identification of languages in multilingual collections, so that separate indexes can be built.

iii. **EPrints**

EPrints is free software developed by the University of Southampton, England. ePrints@IISc repository collects preserves and disseminates in digital format the research output created by the IISc research community. It enables the Institute community to deposit their preprints; post prints and other scholarly publications using a web interface, and organizes. GNU EPrints is general digital repository management software that was born in the University of Southampton. Its developer's goal was creating a flexible platform for building high quality and scalable repositories.

Some important features of Eprints digital library softwares are:

a. Complexity is less when compared to other information system.
b. Many plug-ins are available to improve different functionalities of Eprints as and when required.
c. Robust and stable system that needs minimum maintenance and performance
d. Easy handling of wide range of pre-prints and post-prints research documents.
e. Supports Linux (Debian/Ubuntu and Redhat/Fedora), MS Windows (XP, VISTA), Mac OS.
f. Eprints supports Apache web server and default database is MySQL.
g. Programming language used in this system is Perl (JavaScript and AJAX as scripting language).
h. Works with GNU Public Licensing.
i. Multi language support in both interface and submitted documents are already built-in.

Integrated Library Management Software

An integrated library system (ILS), also known as a library management system (LMS), is an enterprise resource planning system for a library, used to track items owned, orders made, bills paid, and patrons who have borrowed.

Some of the benefits of using integrated libraries in your library are:

- Direct and read-only access to data, preferably through an open source database management system like MySQL.
- A standard way to communicate with the Libraries, preferably through an application programming interface.
- Standards-compliant systems including better security and more complete documentation.
- The ability to run the ILS on hardware that the library selects and on servers that the library administers.

- Greater interoperability of systems, pertaining to the systems within the library (including components from vendors, open source communities, and homegrown systems) and beyond (enterprise-level systems such as courseware and university portals, and shared library systems such as OCLC).
- Greater distinction between the ILS (which needs to efficiently manage a library's business processes) and the OPAC (which needs to be a sophisticated finding tool).
- Better user interfaces, making use of the most current technologies available and providing a single interface to all of the library's holdings, regardless of format.

i. KOHA

KOHA was initially developed in New Zealand by Katipo Communications with Horowhenua Library Trust. It was started on 6th September 1999. It is a full featured integrated library system (ILS). There is no cost for the license, you have the freedom to modify and update the product to adapt it to your satisfaction. Horowhenua Library Trust implemented Koha in January 1, 2000 and the trust released Koha under the most popular and flexible GNU General Public License for deriving support from the global community and ensuring future development of the system.

The Koha source code shows that many different authors retain copyright to their programming contributions. Anyone may contribute to the code, but most development is currently done by a commercial open source firm begun by former employees of the Nelsonville library. The company, Liblime, has bought the Koha Web domain name, acquired the division of the New Zealand Company that originated Koha, and hired employees from major proprietary ILS firms. More than 300 libraries are using Koha both nationally and internationally.

Some of the important features of Koha integrated library management system are discussed as follows:

- It has full support for catalogue, circulation, acquisitions, library stock management.
- Supports Z39.50 server and consists of import/export records (ISO2709).
- It is multilingual and supports multi users.
- There is a full support for MARC21 and UNIMARC for professional cataloguing.
- The programming language used in Koha is Perl and PHP.
- Koha is operating system independent software, i.e. it can be operated on any OS (Windows, Linux, Red Hat, etc.).
- The software requirements for Koha to work in your systems are Apache and MySQL.
- It is platform independent, works with any browser.
- Supports MySQL, a dual database system and also RDBMS.

- Koha also supports digital library management, which is a unique feature on its own.
- Expected to develop and grow more rapidly in next upcoming few years with new features.
- Licensed by GPL "General Public License".
- Koha also supports OAI-PHM.
- It is faster and compatible when compared to any other integrated library management software.

ii. **Evergreen**

Evergreen was born in 2004, using open source development principles and on 5th October 2006 it went live in Georgia PINES. Evergreen is great for public library consortiums with hundreds of branches, but doesn't scale down.

Evergreen supports user/patron management, an ability to perform overdue and produce email notification, limited statistical report generation, a remote access via web browser may be possible and also providing a support for session initiation protocol (SIP). The security precaution pointed out in the document includes strong password, open ports and user permission. [35]

Some of the key features of Evergreen integrated library management software system are mention below:

- Evergreen is in production in school libraries.
- Support search/retrieve via URL and Z39.50 servers.
- Evergreen can run on a laptop with 1.5 GB RAM (50,000 records).
- Evergreen VMWare images run happily in 512 MB of RAM.
- Software required to install evergreen is PostgreSQL.
- Works with operating system Linux.
- Programming languages used here are C, Perl and Python.
- Supports circulation, cataloguing and OPAC.
- Evergreen is an active online community including FAQs, documentation and a supporting software company.

iii. **NewGenLib**

NewGenLib is an integrated library management system developed by Verus Solutions Pvt Ltd. Domain expertise is provided by Kesavan Institute of Information and Knowledge Management in Hyderabad, India. NewGenLib version 1.0 was released in March 2005. On 9 January 2008, NewGenLib was declared Open Source Software.
NewGenLib can be extended to support other languages easily. It also provides RFID integration and supports multiuser and multiple security levels. BiblioteQ supports limited user/patron management, collection of books, journals, DVDs, CDs and video games, which are available in Czech, German and English languages.

Some of the advantages of using NewGenLib are stated as follows:

- Supports Metadata formats: MARC XML, DUBLIN CORE, MODS 3.0 and AGRIS.
- Programming language used for this software is JAVA.
- NewGenLib is operating system independent, i.e. it can be run on any operating system.
- Requirements to work with this software are PostgreSQL and JBoss Application Server.
- Supports Z39.50 server and MARC21.
- It works under the licensing conditions of GNU GPL (General Public License).
- Record display and punctuations in this system are as per ISBD rules.
- It is entirely Java-based, platform-neutral, and uses the following major software

Methodology of the Study

The methodology of this design is totally based on surfing the internet and followed by a small questionnaire. This includes study of some open source software used in most of the universities and organizational libraries. Furthermore this report is based on introducing new open source softwares searched from net, which are new in the web and librarians are unaware of it. The questionnaire contains information to check the satisfaction level of the users of open source softwares, inside the university and some other institutes outside the university. The questionnaire includes data and suggestions collected from different people, like professors, students and librarians. Some of the open source softwares useful in libraries now days are Greenstone, NewGenLive, Invenio, Kuali OLE, PhpMyBiblio, OpenBiblio, Vufind, etc. This study is accomplished by the list of open source softwares available in the internet.

Population of the Study

The number of questionnaire distributed and received were 116 out of which 49 were female and 67 were male. 84 were students, 14 research scholars and 18 were library staff.

Preference of Digital Library Managment softwares by users:

		DIGITAL LIBRARY MANAGEMENT SOFTWARES					
		Greenstone	**%**	**DSpace**	**%**	**Eprints**	**%**
PREFERENCE	**1**	13	34.21	26	72.22	4	17.39
	2	26	42.11	8	22.23	5	21.75
	3	9	23.68	2	5.55	14	60.86
	Total	**38**	**100**	**36**	**100**	**23**	**100**

Preferences of Integrated Library Management Softwares by its users

		ILM SOFTWARES					
		Ever Green	**%**	**KOHA**	**%**	**New GenLib**	**%**
PREFERENCE	**1**	12	33.34	26	57.8	9	20.45
	2	9	25	13	28.88	20	45.45
	3	13	36.10	2	4.45	4	9.09
	4	2	5.56	3	6.65	7	15.92
	5	00	00	1	2.22	4	9.09
Total		**36**	**100**	**45**	**100**	**44**	**100**

Major Findings

The user's study on open source softwares has resulted to the major findings. Some of the major findings are summarized and mentioned below as follows:

(i) The students (72.42%) and research scholars are more aware of open source softwares, and some lecturers are also aware of it. But still awareness is not up to the mark.

(ii) As open source softwares are the upcoming path of this generation, they are very much popular among the young youth.

(iii) Majority of the respondents just know about the open source softwares and its applications, but don't know how to use it in their work places.

(iv) Majority of the respondents, 57.8% prefer Koha above any other library open source software.

(v) DSpace is preferred by most with 72.22%, followed by Greenstone with 42.11% and Eprints with 60.86%.

(vi) Most of the respondents agree to the fact that the share for the open source softwares should be increased.

Suggestions and Recommendations

(i) The library authorities in the educational institutes must take the responsibility to be updated about the open source softwares.

(ii) Teachers should take up the initiative to improve the awareness program among the students and other staffs on OSS.

(iii) Authorities should provide sufficient budget for the installation and customization of the softwares in the institutes or the organization.

(iv) There should be programs and seminars organized for the awareness of the open source softwares and its applications.

(v) Usage of new open source softwares in the libraries should be encouraged by the authority.

(vi) Open source softwares should be introduced in the LIS syllabus itself, so that basic knowledge about the OSS may be given to every students.

(vii) Students should be kept updated about the upcoming softwares so that they can provide their own suggestions for the future modification, if any.

(viii) The administration must take up the initiative for awareness program among non-library staffs.

(ix) A proper cooperation between the staffs and students is required for further development of open source softwares in the organizations.

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