

Open Source Software (OSS) applications in libraries: Special Reference to Integrated Library Management and Digital Library Software

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ABSTRACT:

ICT (Information and Communication Technology) has transformed the libraries' working environment entirely. Today, most of the libraries have been performing their routine works with the assistance of computer technology and this technology has brought with it many benefits such as advancement; reduction in work timing, reduced man power, data preservation and security etc. In this era of technology, Internet is an indispensable phenomenon and has been providing so many technical supports especially in the field of library and information science in the form of Open Sources Software (OSS). These days open sources softwares are becoming prevalent due to its immense significance. The Open Sources software provides free and easy accesses to the libraries as well as users can do changes and modification in it as well as they can run, copy, share, and improve the software with the desired requirements. However, library professional requires basic knowledge of computer to installation and maintenance for Open Source Software. Hence, this paper aims to describe Open Source Software (OSS) applications in libraries theoretically and highlight some major open source library softwares concerns with ILS (Integrated Library System) and DL (Digital Library). Besides, the applications of Open Source Software (OSS) in the current scenario of libraries shall be discussed.

Keywords: ICT, OSS, ILS, DL, Open Sources Software, Computer Technology, Library Technology.

1 INTRODUCTION:

Open Source Software (OSS) is becoming prevalent nowadays. Open Source emerged as an alternative model of software development and revolutionized the software development. The open source projects, usually, start voluntarily and developers' community normally crosses the national boundaries. Internet technologies facilitated a lot to easily share and distribute the project announcements, source codes, software, patches, etc. Open Source Software has dominated the infrastructure of Internet and web services, and has a long history of supporting technology infrastructure (Altman, 2001). Open source is also known as open source software (OSS) or free OSS. The Open Source software whose source code which are available under a public licence or agreement that permits users to read, change and improve the software according to their requirements. The

“source” in open source refers to source code. Source code is a computer file containing statements in a programming language, and those statements are intended to define the performance of a task. If a source code was printed, it would appear to consist of words, abbreviations and mathematical symbols. Source code in itself is useless. It is like a script for a play that has never been performed (Poulter, 2010, 655).

The popularity of open source software is increasing day by day among the users due to its open uses features. Open Source Software is free for anyone but more importantly that it is not only free available software, although, it is also provides facility to copy, share, modify etc. This increases the possibilities of a software program's potential because of this free-

thinking model. Many large groups of programmers have customized basic open source programs into whatever they deemed necessary, and have in turn given these modifications back to the open source community for free where others can continue to build on their work. There are many different kinds of open source software solutions out there today that could be embraced by the library. There's basic operating system, document processing programs, Library Management Software (LMS) and Digital Library software.

Eventually, Open source software is software that provides access to the source code, meaning that users are free to see how the product is made. Additionally, users have the right to modify the product (change the code) to their liking, experiment with different versions, and give away or resell the new product with the guarantee that they must also provide their source code, and so on. Modifying the product and redistribution are the two main components of open source software. OSS offer attractions to the libraries as majority libraries around the world, especially in developing countries, do not afford to purchase costly commercial software. Nevertheless OSS offer cheap alternatives to expensive commercial software with freedom from vendor lock-in and facilitate flexibility to modify for local needs (Rafiq,2009,138).

2 BACKGROUND AND BRIEF HISTORY OF OPEN SOURCE SOFTWARE:

1980 was the year when the open source software movement started. In that era, computer manufacturers inclined to create their own proprietary operating systems for their computers. They also produced their own software applications or sometimes allowed software companies to do as well. Seldom, they bought in a proprietary operating system from a software company. Here, we can't forget name of revolutionary person who had changed the thinking of society regarding open softwares. The name of that person was "Richard Stallman". Richard Stallman was a highly regarded programmer, who worked at MIT's artificial intelligence lab. He grew up writing software that incorporated source code written by others. He was

happy to share source code he had created. According to his opinion building of software was community efforts and when he saw that software was kept hidden from programmer community then he resigned from his position of programmer and he founded GNU project. For spreading awareness and freely use of open software he created a different kind of copyright license, which he termed "copyleft". Under the GNU general licence, you were free to use and modify source code , but if you do modify code , then you must make that modification freely available to others. Stallman was not against selling software. You could sell GNU-licensed software, but you could not sell any software from derived source code that was not freely available to others. To Stallman, free software should be free of restrictions, not necessarily free from cost (Poulter, 2010, 656).

In 1998, Netscape announced it was releasing the source code for its web browser, which sparked a conference held in Palo Alto, California to discuss the strategic process for this extraordinary event. There, the term "open source" software was born and is attributed to Christine Peterson [<http://www.opensource.org/history>]. The Open Source Initiative was soon founded by Eric Raymond, another attendee at the conference, which continues to promote open source education, community building, and awareness of the benefits of open source software. The GNU General Public License (GPL), created by Richard Stallman, is one example of a free software license, cleverly nicknamed a copy left license. Effectively, copyleft licenses use copyright law to require the derived works to be available for modifying and distributing under the general philosophies of free and open source software. Obtaining a GPL, or another form of copyleft, assures that these open source rights are legally enforced (Lochhaas and Moore, 2010).

The successful examples of OSS solutions include operating systems like LINUX, FreeBSD, openBSD and NetBSD, web browsers that include Firefox and Konqueror, graphical environment like KDE and Gnome, productivity applications like OpenOffice and programming language and infrastructure solution like Apache and MySQL, library management and Digital

library software such as Koha and Dspace.

(Hanumappa, Dora and Navik 2014, 409)

3 SIGNIFICANCE OF OPEN SOURCES SOFTWARES:

Today open source software has become critical for almost every organization. Almost everything requires open source software, be it telecommunication systems, inventory, accounting, personal productivity applications, contact management and operating systems amongst others. In the field of library and information science, open source software has been giving immense support to make this field more automated and advanced. Following are the significance of Open Source Software in view of library and information science field:

3.1 Least cost then commercial software:

Open Source software generally not required any type of licensing fee or we can say that most of the open sources are available free of cost, although sometimes software requires expenditure for media, documentation and support.

3.2 Simplified license management:

Open source software provides simplified license to users. They called “Four Freedoms” in which they provide license to their user:-

- (a) Use the software without access restrictions, within the terms of the licence applied.
- (b) View the source code.
- (c) Improve and add to the object and source code, within the terms of the licence applied and this may include a term making it mandatory to publish modified code on the community website.
- (d) Distribute the source code.

3.3 More Flexible:

open source software not need to abide by a specific IT architecture that might require you to upgrade your software and even hardware often. Rather, you can mix and match your software and create a unique IT infrastructure that best suits your needs. There’s no need to fret since there’s a wide range of options in the market, so you only have to browse through them and pick one those that match your requirements and specifications.

3.4 No need of vendor Agreements:

Software vendors can apply a number of tactics to persuade their customers to upgrade more or less willingly. Typical tactics include moving to allegedly new and improved file formats (which require the new and improved software to read them) or to withdraw support and bug fixes for older versions after a short period. The problem for users of the software is that they rarely have much control over that process and are left isolated if they choose to remain with older versions that they consider to be acceptable. In that case open source software gives freedom to the users that they are not bound to purchase upgrade module or don’t need to pay any annual maintenance charge (AMC).

3.5 Integrate Management:

Through open source software, libraries can benefit from integrated management. Integrated management means incorporative system in which libraries can perform their daily works freely moreover that system provides common information model (CIM) and web based enterprise management (WBEM). These ultra modern technologies enable you to integrate and combine server, application, and service and workstation management. This integration would result in well-organized administration.

3.6 Reliability:

There are two main reasons why open source software is reliable. Firstly, they’re developed chiefly by skilful and talented experts who do their best to create high-quality programs. Second, they’re worked on by tens or hundreds of people, which means there are numerous eyes that can monitor for the presence of bugs and many pairs of hands that can fix these defects within the shortest amount of time. Both of these factors lead to products that have excellent quality and helpful features and perform well most (if not all) of the time.

3.7 Globally Support:

As we are discussing that mostly open source software are available free of cost and these software accessible through the online communities with help of Internet. These online communities provide online support to the users with the open hart at globally. Many communities are working to provide supports of any issue concern with software’s 24X7 with any charge.

Besides, some of tech companies are now providing their support to installed and execute open source software with charges.

3.8 Advanced and Quality Software:

Many survey and research shows that qualities of open source software's are reliable and day by day this software is being advanced. For instance, Koha, Linux, Dspace these are the some example of open source software which are being advanced gradually.

4 OPEN SOURCE SOFTWARE FOR LIBRARIES:

Open source library software presents a system for managing and presenting of information collections. It helps to operate and manage libraries and building collections with data searching facilities. Moreover, they are easily maintained and can be augmented and rebuilt automatically. With many Open Source Software (OSS) applications now available for library and information management, Organizations now have novel options for acquiring and implementing systems. The Open Source Software applications for library and Information management that will be discussed in this paper are in two major parts:

- (a) Library Management Softwares
- (b) (Integrated Library Systems)
- (c) Digital Library Management Softwares (DLMS)

4.1 LIBRARY MANAGEMENT SOFTWARES:

Some of the renowned library management software's are as follows:

4.1.1 Koha:

Koha is one of the most popular open source ILS (Integrated library system) being used by the libraries globally. It was the first open source library management software for libraries developed in 1999 by Katipo Communications from New Zealand. The name Koha comes from the "Maori" (it is one of New Zealand's official languages) word for a gift or donation, which is very convenient, considering Koha's availability for a distribution under the open source General Public License (GPL). Koha is an application based on Linux, Apache, MySQL and Perl.

To keeping Indian libraries scenario in the mind, many libraries can't afford expensive library management software, for them Koha is a best alternative. As we discussed it is an open source so it is available free of cost for everyone. Besides, Koha uses library ILS standards and gives the OPAC/ Web OPAC (open public access catalogue) facility to the users and very advanced features. Moreover, koha communities provide technical support worldwide in order to solve any problem during use of Koha by libraries.

4.1.1.1 Key Features of Koha:

Some of the key features of Greenstone are as follows: (Aute & Ghumare, 2014, 321)

User Friendly: Koha is a very user friendly software. It has easy-to-use circulation policies, strong patron management, intuitive navigation, and extensive permissions for staff accounts.

Excellent data record management: Koha has an excellent data record management system. It is like a parent-child relationship for user's records, as well as a 'copy' user feature to quickly add families.

Unique Services: Koha provides some unique services to libraries such as a clubs and services feature that allows libraries to manage reading groups, book clubs, and other community outreach programs. This feature is easily managed by library staff.

Books holds management: Koha provides extensive support for holds, including an option to 'suspend' and 'reactivate' a hold, an option to place holds from a patron's OPAC account, an option to allow staff to re-organize the holds queue, and an option to place holds at either the title or item level.

Records updating features: Koha has a very good enhanced matching policy rules for the 001 and 035 tags, allowing libraries to update older records with a newer version.

Flexible data import features: Koha provides excellent features to import data. If something wrong happens then libraries have 'Undo' option for entire import batches from the catalogue in a single click, instead of having to delete on a one-by-one basis.

Standard worldwide technologies: Koha has numerous worldwide standard technologies such as OPAC/Web OPAC, staff, administrative features and

self-checkout interfaces are all based on standards-compliant. World Wide Web technologies—XHTML, CSS and Javascript—making Koha a completely Web-based solution.

Advanced Technology support: Koha has good technical support features. It provides SIP2 configuration for a wide variety of vendors and their products, including ITG, 3M, Envision Ware, Talking Tech, Overdrive, Tech Logic, and Libratica. Koha also works with Ez Proxy as a dual authentication source for remote database access.

International standards and guidelines: Koha follows international standards and libraries guidelines in order to import-export data like Z39.50, SRU, and SIP2 XML-tagged MARC record storage provide quick access to data.

Complete library integrated system: Koha is complete integrated library management software. It is fully developed ILS functionality including Course Reserves, Acquisitions, Serials Control, etc.

(a) NewGenLib:

(New Generation Library) 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. On 9th January 2008, NewGenLib has been declared Open Source Software under General Public License (GPL) by the Verus Solutions Pvt Ltd, Hyderabad, India.

Some advanced functional features of NewGenLib:

- (a) Android mobile and tablet friendly.
- (b) Incorporation with Twitter.
- (c) Flexibility of defining own search field in OPAC.
- (d) Enhanced contents and imaging features available in OPAC like Book jackets, Google preview etc.
- (e) RSS Feeds facility.
- (f) Provide suggestion for other book which is available in the library.
- (g) RFID supports.
- (h) Configurable SMS system supports.
- (i) Incorporation with Gmail.

- (j) Catalogue can be harvested through Google site map and many more.
(<https://en.wikipedia.org/wiki/NewGenLib>)

(b) Evergreen:

One of another option in open sources software is “Evergreen” ILS system. The Evergreen Project was initiated by the Georgia Public Library System in 2006 to serve their need for a scalable catalogue shared by (as of now) more than 275 public libraries in the state of Georgia. After Evergreen was released, it has since been adopted by a number of library consortia in the US and Canada as well as various individual libraries, and has started being adopted by libraries outside of North America (<https://evergreen-ils.org/about-us/>). Evergreen has feature such as stable, robust, flexible, secure, and user-friendly. It’s developed by Equinox Software.

4.2 DIGITAL LIBRARY MANAGEMENT

SOFTWARES:

Some of the renowned digital library management softwares are as follows:

4.2.1 Dspace:

DSpace 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 for the creation, indexing, and searching of associated metadata to locate and retrieve the items. DSpace design and developed by Massachusetts Institute of Technology (MIT) Libraries and Hewlett-Packard (HP). DSpace was designed as an open source application that institutions and organizations could run with relatively few resources. It is to support the long-term preservation of the digital material stored in the repository. It is also designed to make submission easy. DSpace supports submission, management, and access of digital content (Naik & Shivalingaiah, 2006, 31).

4.2.1.1 Key Features of Dspace:

DSpace can be customized in the following key ways to suit any library needs: (<http://www.dspace.org/>)

Customize or theme the user interface: libraries can fully customize the look and feel of DSpace website so it will integrate seamlessly with your own institution's

website and can be more intuitive for your users. DSpace provides two main user interface options: the traditional (JSP-based) interface, and Manakin (XML-based) which provides various "themes" out of the box.

Customize the metadata: Dublin Core is the default metadata format within the DSpace application. However libraries can add or change any field to customize the application. DSpace currently supports any non hierarchical, flat name space, although it is possible to ingest other hierarchical metadata schemas into DSpace such as MARC and MODS. This requires using tools such as crosswalk and having some technical capability to map the transfer of data.

Configure Browse and Search: libraries can decide what fields you would like to display for browsing, such as author, title, date etc. on the timing of designing DSpace website. Libraries can also select any metadata fields which they would like to include in the search interface. All of the text within a given item and metadata associated with the item, are indexed for full text search if desired.

Local authentication mechanisms: DSpace comes with plugging for most university authentication methods, including LDAP (and hierarchical LDAP), Shibboleth, X.509, IP-based. In addition, DSpace comes with its own internal authentication method, or can be configured to use multiple authentication methods at once. Libraries can also build your own authentication plug-in if library use a custom authentication mechanism.

Standards Compatibility: DSpace complies with many standard protocols for access, ingest, and export. The standards DSpace supports include: OAI-PMH, OAI-ORE, SWORD, WebDAV, OpenSearch, OpenURL, RSS, ATOM.

Multiple Languages: The DSpace web application is available in over twenty languages. So if English is not your local language so libraries can customize the language which DSpace uses. Libraries can also configure DSpace to support multiple languages, so that the language your user sees is the 'preferred language' set in their web browser.

4.2.2 Greenstone Digital Library Software:

The Greenstone digital library software is an open-source system for the construction and presentation of

information collections. It is a digital library project from New Zealand that provides a new way of organizing information and making it available over the Internet. Collections of information comprise large numbers of documents (typically several thousand to several million), and a uniform interface is provided to them. Moreover, they are easily maintained and can be augmented and rebuilt entirely automatically. The system is extensible software "plugins" accommodate different document and metadata types. The aim of the Greenstone software is to empower users, particularly in universities, libraries, and other public service institutions, to build their own digital libraries (Naik & Shivalingaiah, 2006, 29).

Key Features of Greenstone: Some of the key features of Greenstone are as follows: (Tramboo & Humma, 2012, 5).

Accessible via web browser: Collections are accessed through a standard web browser (Google Chrome or Internet Explorer) and combine easy-to-use browsing with powerful search facilities.

Full Text and Field Search: The user can search the full text of the documents, or choose between indexes built from different parts of the documents.

Flexible browsing facilities: The user can browse lists of authors, lists of titles, lists of dates, classification structures, and so on

Create access structures automatically: The Greenstone software creates information collections that are very easy to maintain. All searching and browsing structures are built directly from the documents themselves. No links are inserted by hand, but existing links in originals are maintained.

Make use of available metadata: Metadata, which is descriptive information such as author, title, date, keywords, and so on, may be associated with each document, or with individual sections within documents.

Customization: The Greenstone allows customization of presentation of collection that are based on Extensible Style sheet Language transformation (XSLT) and other agents that govern the definite functions of Digital library.

Multilingual Support: Unicode is used throughout the software, allowing any language to be processed in a consistent manner. To date, collections have been built containing French, Spanish, Maori, Chinese, Arabic and English. On-the-fly conversion is used to convert from Unicode to an alphabet supported by the user's web browser.

Collections support multiple formats: Greenstone collections can contain text, pictures, audio and video clips.

Administrative function provided: An "administrative" function enables specified users to authorize new users to build collections, protect documents so that they can only be accessed by registered users on presentation of a password, examine the composition of all collections, and so on.

Collections can be published on the Internet or on CD-ROM: The software can be used to serve collections over the World-Wide Web. Greenstone collections can be made available, in precisely the same form, on CDROM.

(a) EPrints:

EPrints is free software developed by the "University of Southampton, England". EPrints repository collects preserves and disseminates in digital format the research output created by a research community. It enables the community to deposit their preprints; post prints and other scholarly publications using a web interface, and organizes these publications for easy retrieval. It is the world's first, most widely used, and by far the most functional of all the available OA IR software's. EPrints was created in 2000 as a direct outcome of the 1999 Santa Fe meeting that launched what eventually became the OAI-PMH. EPrints is an extensible content management system. It has been extensively configured to accommodate the needs of academics and researchers amid at dissemination and reporting, but it could be easily used for other things such as images, research data, audio archives - anything that can be stored digitally, but you'll have make more changes to the configuration. EPrints is OAI-complaint. It is highly configurable to achieve diverse needs, built on a coding platform that is amendable to rapid development.

Key Features of EPrints: Some of the key features of EPrints are as follows: (**Tramboo & Humma, 2012, 6**).

Accessibility via web browser: EPrints provides web based interface that makes it easy to use and administer.

Full Text and Field Search: Searching in EPrints allows scanning each of the metadata field types in the database by using simple or advanced search. Any metadata field can be searched with fine granularity by SQL querying the database.

Administrative function provided: EPrints archive can use any metadata schema as being provided by the administrator. The administrator decides what metadata fields are held about each EPrints item.

Open Source Software: EPrints uses traditional technologies and runs on pure Open Source systems. It uses MySQL, Apache database and web server.

Three user roles: EPrints provides three users roles such as administrator, editor, and author. They are controlled all back and front records.

OAI-PMH Support: EPrints is fully interoperable with OAI (Open Archives Initiative) Protocol for Metadata Harvesting. Open Archives protocol allows sites to programmatically retrieve or 'harvest' the metadata from several sources, and offer services using that metadata, such as indexing or linking services.

Multilingual Support: Unicode is used throughout the software, allowing any language to be processed in a consistent manner.

File formats supported: Functions with many file types, including: PDF, HTML, JPEG, TIFF, MP3, and AVI etc.

5 CONCLUSION:

It has observed that ICT (Information and Communication Technology) has reformed the field of library and information science entirely. Today, most of the libraries are taking help of automation to manage their daily library works and availability to Open Source Softwares through Internet which provides another suitable option to the library professionals in the field of automation. Open Source Softwares have given the opportunity to the librarians that they can chose free softwares and at the same time money can also be saved. Consequently, saved money may be

utilized to purchase other useful things such as media resources (book, journals, etc) or can be used to hire educated, technical support that is provided to the users for the better use of existing resources. Moreover, these free softwares are constantly being updated, changed and customised to meet the library's needs. Apart from this, there is one more important factor that India is the country which has been moving towards digitisation; Indian government has been promoting electronic ways in each and every field. So this is the right time when we the library professional have to accept the mode of digitisation and take the benefits from open sources as well as have to participate in Digital India Campaign. Therefore, present article has given an overview on "Open Sources Softwares" with special reference to library management softwares and digital library management softwares for which some of renowned softwares are discussed. Hopefully this article will provide some introductory information to the library professionals and give motivation towards "Open Sources Softwares".

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