MANAGING DIGITAL LIBRARY WITH OPEN SOURCE SOFTWARES: WITH SPECIAL REFERENCE TO KOHA

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Abstract

With the growing technology, the challenges for librarians and libraries are growing with the same pace. Even the definition and role of library has changed for the diverse user community of the modern era. This paper discusses different open sources, different softwares available for libraries, initiatives by various organizations, advantages and limitations of open source, and detailed features of KOHA and its popularity in India.

Keywords : Open Source, OSS, OSS for Libraries, Digital Library, Koha, IISERs, IISERB

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Introduction

Automation in any library covers the basic functions including cataloguing, circulation, acquisition, serials control and reference services. Modern digital libraries are working and moving on the way to match the user work pattern and this is true speacially for the libraries of research institutes like IISERs.Many commercial softwares are available in market for library management like LibSys, VTLS etc. for which new libraries have to pay good amount of money. The main attraction towards open source softwares (OSS) is its availability at no cost alongwith the source code. 'Free' and 'Open Source' are being used as synonymous terms. Free, here, refers to one's freedom to use rather than freedom from price (Stallman, 1998a).

Emergence and development of Open Source Softwares

Eric Raymond, author of *The Cathedral and the Bazaar* and co-founder of the Open Source Initiative, agrees but says, for practical purposes, that the birth of the Open Source, Free Software, culture we that know today can be conveniently dated to 1961 (Raymond, 1999).

In 1983 the Free Software Foundation was founded by Richard Stallman and the term 'Open Source' was introduced in 1998. It grew out of MIT's Artificial Intelligence Laboratory where Stallman worked throughout the 1970s and early 1980s. In 1985, to promote the software that the GNU Project was producing, Stallman created the Free Software Foundation (FSF), a tax-exempt charity for the development and promotion of free software
(Stallman, 1999).

Free access to library resources, like free access to software, has often been confused with a freedom from cost. This is not how the word free, in this context, should be understood. Richard Stallman (2000) says, "Free software is a matter of liberty, not price … Free software refers to the users' freedom to run, copy, distribute, study, change and improve the software." As per Ranganathan's law ' Every reader his/her book', but this does not mean that there is no cost involved with this facility. Free software, on the other hand, is often made available on a web site for no charge other than the cost of an Internet connection and, at the same time, sold on a compact disc for a profit; free software can also be given, freely, from one person to another. Richard Stallman (2000) says, "You should be free to redistribute copies, either with or without

modifications, either gratis or charging a fee for distribution, to anyone anywhere. Being free to do these things means (among other things) that you do not have to ask or pay for permission."

There are many open software projects that libraries use, often without even realizing they are using, open source software. These programs are often Internet based, have a long history of successful use, and are generally recognized by the computing community as stable, reliable, and well supported by their developer communities. Examples of such open source projects include BIND, Perl, Apache, and Linux. If a library is connected to the Internet, more than likely it is using at least two or three of the above in one way or another. The last, Linux, is probably installed in the library even if the administration or system administrators are unaware of it.

BIND is an open source program that any library on the Internet probably uses. BIND, the Berkeley Internet Name Domain package, is software that allows one computer to find another without having to know its unique Internet Protocol (IP) numeric address. BIND has been in use since 1984.

Perl is another open source project that is widely used. A scripting language, Perl is responsible for much of the active content on the World Wide Web. It has been called the "duct tape of the Internet." Perl has been in use since 1987 and is most commonly used for CGI scripting, accessing databases, text processing, XML processing, system administration, web transactions, and many other activities.

Apache, an open source web server, is more than likely the web server most libraries are using to serve their library's web site, assuming libraries select a web server for the same reasons other site owners do. Since January, 1998, Apache has been the number one web server used on the World Wide Web, as noted in a survey by Netcraft; the survey's authors observe that Apache is used on over fifty percent of the World Wide Web's web sites (Apache Software Foundation, 1998).

Initiatives of National and International Organizations

1. International organizations like UNESCO,United Nations Development Program (UNDP) FSF, IFLA, International Open Source Network(IOSN) promoted open source in e-learning, content management, digital library and integrated library management fields.
2. In India, Knowledge commission under chairmanship of Sam Pitroda recommended open source software for e-governance and information management.
3. UNESCO's FOSS Portal can be found at http://www.unesco.org/cgi-bin/webworld/portal_freesoftware/cgi
4. CDS/ISIS as a software has been 'free' and 'open' since its early days, long before Free and Open Source Software (FOSS) became a known software model.
5. The Asia Pacific Development Information Programme (APDIP) is an initiative of the United Nations Development Programme (UNDP) that aims to promote the developmemt and application of new information and communication technology(ICT) for human development in Asia Pacific region.
6. International Open Source Network (IOSN) is an initiative of APDIP and supported by the International Development Research Center of Canada. IOSN provides policy and technical advice on FOSS to governments, civil society and the private sectors and works primarily through its web portal www.iosn.net/ that is collectively managed by FOSS community.
7. IFLA working with other agencies actively engaged in open source to encourage regional support initiatives for open source, recommended projects that facilitates adoption of open source and work with UN/UNESCO and EIFL-NET in their open source initiatives.

Advantages of OSS

1. Provides cheaper option to the Librarians in comparison to commercial softwares. The expenditure hardly is for media, documentation and support if required.
2. Source code is available to the libraries.
3. License management is very simple, because as many times it can be installed and in number of locations as required once the library has obtained the software.

4. It can be better quality and more secure and less prone to bugs than proprietary systems, because it has so many users and developers poring over it and weeding out problems.
5. Dependence on vendors in not involved.
6. The library is free to modify and use the software according to their particular requirements.
7. Support is available freely through online community via internet and many technological companies are also supporting with free online and multiple levels of paid support.
8. The software can be used in any way and for any legal purposes.
9. There is no restriction in a unilateral way on how the software could be used.
10. Specific technologies such as Common Information Model and Web Based Enterprise Management provide the capability to integrate or consolidate the server, service, application and workstation management for powerful administration.

Limitations of OSS

1. There is no assurance on when the codes are going to be fixed if there a bugs in it, as no one is responsible for the codes. There, unless the problem is solved one is supposed to use the problematic software.
2. OSS requires technical expertise to operate and maintain open source costs more to support because the software is typically self supporting.
3. Open source usually comes without warranty and after sales support should the software fail or malfunction. This is because the software usually distributed free of charge or sold for very minimal fees.

OSS available for Libraries

Basic Computer Programs

1. **Ubuntu**: The most popular player in the Linux-based operating system game. (Linux is the open-source answer to Microsoft's Windows operating system; Ubuntu is a modification of Linux). Ubuntu is a perfect solution for libraries who need to upgrade their older computers using outdated Windows or for bulk computer purchases requiring a new operating system.
2. **Firefox:** Firefox is the Mozilla organizations answer to Microsoft's Internet Explorer web browser, and has taken the web by storm over the past few years as the biggest competitor to IE in quite some time. Firefox offers a much more secure browsing experience compared to IE.
3. **Open Office**: Another component you'll find bundled with your Ubuntu operating system is a software package known as Open Office. Open Office can do the same thing, and you can use both programs to handle each others file formatting. Open Office also comes with a calculator, draw, and mathematics program as well.
4. **Thunderbird:** Thunderbird, is the Mozilla foundations open-source alternative to Microsoft's Outlook Express. The program works exactly like Outlook, providing you with a secure and safe desktop email solution. And just like Firefox, the open source programming community has created free add-ons to make the Thunderbird email client customized to your liking.

Digital Library Management Softwares

1. **Koha:** It is a promising full featured open source ILS (integrated library system) currently being used by many of the libraries all over the world. It was created in 1999 by Katipo communications for the Horowhenua Library Trust in New Zealand. Koha is built

using library ILS standards and uses the OPAC (open public access catalog) interface.It supports MARC 21 and UNIMARC support, Z39.50.

2. **Evergreen**:Evergreen ILS is another option when researching open source ILS options. Developed by Equinox Software, **Evergreen is a robust, enterprise level ILS solution** developed to be capable of supporting the workload of large libraries in a fault-tolerant system. It too is standards compliant and uses the OPAC interface, and offers many features including flexible administration, work-flow customization, adaptable programming interfaces, and because its open source, cannot be locked away and can benefit from any community contributions.
3. **NewGenlib**: It 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 under GNU GPL.[1] The latest version of NewGenLib is 3.0.4 R1 released on 13 September 2012.[2] Many libraries across the globe (mainly from the developing countries) are using NewGenLib as their Primary integrated library management system as seen form the NewGenlib discussion forum .

4. **VuFind**: This is a new open source OPAC that you can put over your ILS (in this case, replacing the basic OPAC of Koha). **VuFind suggests that is is "the library OPAC meets Web 2.0"**; it enables users to search through all of your library's resources (as opposed to limited resources through the traditional OPAC) through an easy to use web interface. VuFind is modular, meaning that you are free to only use the components of the program that you deem necessary. VuFind is powered by another open source program known as Solr Energy (Apache Solr, an open source search engine technology).
5. **LibLime: It** is an open source library automation system and is the library communities most trusted open-source software solution. **LibLime provides commercial support services including hosting, migration assistance, staff training, and software maintenance, development, and support.** LibLime will help take care of installation of the aforementioned Koha and Evergreen Ils programs if your library does not have the in-house technical support to install it yourself, and because of their expertise in the library

environment, are the most educated partners to have when deciding on which solutions to use in your specific library.

6. **PhpMyLibrary:** It is a PHP MySQL Library automation application. The program consist of cataloging, circulation, and the webpac module. The programs also has an import export feature. The program strictly follow the USMARC standard for adding materials.
7. **OpenBiblio**:OpenBiblio is an easy to use, open source,automated library software written in PHP. This software has facilities of OPAC, circulation, cataloging, and other administrative work. OpenBiblio is well documented, easy to install with minimal expertise and designed with common library feature.
8. **Avanti** :Avanti Micro LCS Software is developed by Avanti Library Systems in Java language. This is a small, simple, and easy to install and use open source software.
   It is a platform independent, and can run on any system that supports a Java runtime environment. This software is useful for small libraries; it has a powerful and very flexible architecture that allows it to be adapted for use in libraries of any type. This software incorporates standards such as MARC and Z39.50 as modules and interfaces.
9. **ABCD**: This represents the "Automation of libraries and Centres of documentation". The name itself expresses the ambition of the software suite to provide not only automation functions for traditional libraries but also other information providers such as documentation centers. It has been developed by BIREME (WHO, Brazil) in collaboration with the Flemish Interuniversity Council, Belgium, and using UNESCO's ISIS database technology. This software provides flexibility and versatility (Dhamdhere,2011). The bibliographic structures, including all types of digital resources, can be managed by this software and created along with non-bibliographic structures (Dhamdhere,2011).The first version of ABCD(v1.0) was released on 5th December,2009. ABCD has been built up with technologies such as ISIS database,ISIS formatting language,CISIS, ISIS Script, ISIS NBP, Java Script, Groovy and Jetty, PHP, My SQL, Apache, and YAZ.
10. **E-Prints** : E-Prints has been developed at the University of Southampton School of Electronics and Computer Science in 2000 and released under a GPL license forbuilding open access repositories that are compliant with the Open Archives Initiative Protocol for

Metadata Harvesting (OAI-PMH). It shares many of the features commonly seen in document management systems, but is primarily used for institutional repositories and scientific journals.

11. **Fedora**: Fedora software gives organizations a flexible service oriented architecture for managing and delivering their digital content. Digital objects exist within a repository architecture that supports a variety of management functions. All functions of Fedora, both at the object and repository level, are exposed 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.
12. **Greenstone**: The Greenstone Digital Library Software (GSDL) is a top of the line and internationally renowned 'Open Source Software' system for developing digital libraries, promoted by the New Zealand Digital Library project research group at the University of Waikato and is sponsored by the UNESCO(http://www.unesco.org). The software is issued under the terms of GNU General Public License. Greenstone provides a way of building,maintaining and distributing digital library collections,
opening up new possibilities for organizing information and making it available over the Internet or on CD-ROM.
13. **D-Space** : D-Space is an open source software package that provides the tools for management of digital assets, and is commonly used as the basis for an institutional repository. It supports a wide variety of data, including books, theses, and 3D digital scans of objects, photo-graphs, film, video, research data sets and other forms of content. The data is arranged as community collections of items, which bundle bit streams together.D-Space isalso intended as a platform for digital preservation activities. D-Space was released by HPMIT Alliance in 2002 and since its release is very popular open source software. It has been installed and successfully working extensively and widely in universities, higher education colleges, cultural organizations, and research centers etc.It is shared under a Berkeley Software Distribution license, which enables users to customize or extend the software as needed.

KOHA

Koha, the name comes from a Maori language which means gift or donation. It is an open source Integrated Library System (ILS), used world-wide by public, school , special libraries, and academic libraries. Koha was created in 1999 by Katipo Communications for the Horowhenua Library Trust in New Zealand, and the first installation went live in January 2000.

In India it is becoming popular mainly due to its active user's community. Many prestigious library automation projects in India have adopted Koha due to its capability to handle India languages. In the year 2000 Koha was deployed in India in St. Joseph's College, Devagiri in the state of Kerala. Thereafter, there have been a number of installations in India and the group of active users of Koha is also growing.Delhi Public Library started using Koha in 2007 which has a collection of over 15 lac books. The Government of Kerala has basically made a decision to make Koha as its official software to computerization of Government administered libraries. Educational institutions under Institute of Human Resources Development (IHRD) have adopted Koha in their libraries by providing in-house training for library professionals.Professional organizations, library schools and prestigious libraries in India have organized Koha workshops. DELNET, NCSI, DRTC, Kerala Library Association, Cochin University, University of Kerala, University of Burdwan, Mahatma Gandhi University, NISCAIR and OSS Labs have organized Koha training. Koha is distributed under the Free Software General Public License (GPL) version 2 or later.

Main features of Koha

- A full acquisitions module complete with budgets, book funds, suppliers and exchange rates.
- Circulation: a fully featured circulation with circulation rules customisable to suit your library.
- An OPAC: the public side of Koha. This has all the features you would expect, plus enhanced content from sources like Amazon, Google Books, etc.

- Flexible reporting: you have access to all the data in the database and a reporting engine is provided to help you query it.
- Customisable item types: you can choose exactly how you want to catalogue your items. This flexibility also allows Koha to be used to manage inventory such as cameras or computers.
- Barcode scanning: Koha works in a web browser, so any scanner that works with your PCs can be used with Koha.
- Barcode printing: Koha can be used to print barcodes and spine labels.
- User management: Koha manages your users, including integration with systems like LDAP, Radius, Active Directory and SAML, to allow single sign-on.
- Koha uses a full text indexing engine to allow for fast and powerful searching of all of your metadata.
- Mature support for all major library standards including MARC21, UNIMARC, Z39.50, SRU/SW, SIP2 and many more.
- Automated overdue notices either by email or SMS. Koha can also send advance notices to warn a borrower that an item is nearly due. Koha can email issue slips instead of printing them at point of circulation.
- Koha can work in consortia, multi-branch or single-branch mode.
- Koha has been translated into many languages including Te Reo Māori.
- Koha has an offline circulation module.
- Self Check: Koha can be used with any SIP2 compliant self-check machines.
- Faceted search: Search results are classified for easier drilling down.

Benefits over any other proprietary ILS

Distributed under the General Public License, Koha has no vendor lock-in, no set term contracts, and no restrictions on changing support or exporting your data at any given time. As a Koha user you are in control of your ILS. You have the freedom to tailor your ILS specifically to your requirements, your collection, your budget and your patrons. You also have the security of knowing that there will always be technical support for Koha, since it isn't tied to a single manufacturer or vendor.

The benefits of Koha as open source software are that bugs can be dealt with as soon as they are logged, and users have open and constant dialogue with the developers that leads to a positive and collaborative environment. This is a driving force of the Koha community and leads to higher customer satisfaction rates than often found in traditional ILS's.

Koha is continually updated, so you can choose to benefit from new features frequently, rather than having to wait for major all-in-one version releases of your current system.

Koha Live CD's

Koha Live CD's are useful tools for installation and learning purpose. A 'Live CD' is a bootable CD, which contains pre-configured software which allows user to be productive without accessing any other hard drives. Live CDs and DVDs should not be used to run a library. These are not officially supported by Koha, and any difficulties should be taken up with the creator of them.

Koha 3.8.6 Live CD Lite released

Koha Live CD Lite is based on Ubuntu 12.04 LTS and Koha 3.8.6. File size is 690 MB. Live CD is customized for ready to use. Highlights are:

- Easy installation steps,
- Koha installation based on Ubuntu packages, it means easy to upgrade Koha in future,
- Koha customised for ready to use,
- Zebra server enabled,
- Customised MARC fields in cataloguing,
- Scheduled database backup,
- Build on Ubuntu 12.04 LTS with OpenBox Desktop,
- Detailed Read Me file,
- Sample reports,

Visit for download https://sourceforge.net/projects/kohalivecd-lite/files/

Upgrade to new version of Koha is now very easy with this Live CD. No need to execute lot of commands and editing various files to upgrade to a new version. Installation made from Koha

package repository. When new version of Koha available, you can upgrade Koha using only two commands in Terminal. It automatically download new release from Internet and will make necessary changes.

Major Indian Academic Libraries adopting Koha with help from OSS Lab

In the year 2011- 2012 , major academic libraries in India have adopted Koha with our help, here is a listing:

- North East Hill University, Shillong
- University of Agricultural Sciences, Bangalore
- Goa University, Panajim
- Indian Institute of Technology, Mandi
- Chennai Mathematical Institute, Chennai
- Bhavans Library, Mumbai
- Azim Premji University, Bangalore

Many more can be included in the list above but

CONCLUSION

In India Koha is being adopted by many new institutes of reputation like IISER Mohali , IIT Mandi and now IISER Bhopal is also moving on the same path. The study shows that future of OSS is very bright in the libraries in the world including India. The library professionals should be very alert and work together to adopt the open source softwares to increase their utility and efficiency for the benefit of the whole library community.

References

1. *Raymond, E. (1999). A brief history of hackerdom. Open Sources: Voices from the Open Source Revolution [Online]. Available:http://www.oreilly.com/catalog/opensources/book/raymond.html [2000, March 12].*
2. *Raymond, E., ed. (2000). The jargon file. Jargon File Resources [Online]. Available: http://www.tuxedo.org/~esr/jargon/jargon.html [2000, March 13].*
3. *Apache Software Foundation (1998). Apache webserver serves over half the Internet. Apache Home Page [Online]. Available: http://www.apache.org/press/05Jan98.txt [2000, April 16].*

4. https://www.unjiu.org/en/reports-notes/archive/JIU_REP_2005_7_English.pdf
5. www.inflibnet.ac.in/caliber2013/ppt/a3_3.pptx
6. http://en.wikipedia.org/wiki/NewGenLib
7. http://www.sahc.kedah.edu.my/a_portal/portal_tekvok/ict/nota_com_sys/Microsoft%20Word%20-%20les_58.pdf
8. http://www.collegeonline.org/library/managing-expenses/open-source-library.html
9. http://code.google.com/p/phpmylibrary/
10. http://www.academicjournals.org/article/article1379696637_Reddy%20and%20Kumar.pdf
11. http://en.wikipedia.org/wiki/Koha_%28software%29
12. http://onl.org.nz/koha-features
13. http://kohageek.blogspot.in/2012/10/koha-386-live-cd-lite-released.html
14. http://www.osslabs.biz/news/major-academic-libraries-adopt-koha