OPEN SOURCE SOFTWARE (OSS) AND THEIR IMPORTANCE FOR LIBRARIES: A STUDY

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Abstract

Open Source Software (OSS) is, software that users have the ability to run, copy, distribute, study, change, share and improve for any purpose. Open Source Software (OSS) is emerged and it does not need the initial cost of commercial software and it enables libraries to have greater control over their working environment. Here an attempt has been made to library professionals should be aware of Open Source Software (OSS) importance for libraries and its advantages and disadvantages, risk factors for using open source software to manage the library house-keeping operations effectively.

Keywords: *Open Source Software (OSS) and importance for Libraries, Open Source Software (OSS) - Advantages and Disadvantages, Open Source Software (OSS) for Library Automation and Risk Factors in Open Source Software (OSS).*

1. INTRODUCTION

Library Automation is synonymous with Computerization. Therefore, when it comes to Computerization, Computers do not well software as it is well known that computers consists of basically two major components namely the hardware and the software, without software no computer works and thus you know without software computerization will not be possible. Library house-keeping operations may be computerized and then there was a big question, how to computerize or automate library services and library operations. At the same time most of the libraries since there were not for profit making. The Organizations did not come forward in the past to automate the library services. Therefore, the organizations or the companies which are developing software also did not show any interest in developing software for libraries. In the past, the major libraries, large scale libraries and then libraries attached to big organizations and industries, they could offered to develop in-house software. But that in-house software had their own limitations and they were rather suitable for only particular library or library of a particular organization. Therefore, when library automation started picking up then the commercial companies also have realized forecast that, they will have better market if they develop library automation software then they started developing automation software. There emerged proprietary library automation software and since this is commercial software. This

was files heavily and then as it is notepad that there are various types of libraries, large libraries, medium libraries and small libraries, like National libraries, libraries attached to International Organizational and libraries attached to National level research organization and University libraries of large libraries, they could offer to subscription or rather acquisition of proprietary library automation software. But then the medium and small scale libraries as it are they were suffering from financial franchise. They could not really purchase the proprietary software and then automated the library occupancies. Therefore, the medium and small libraries had disadvantages rather they were like handicapped, lagging behind in automating their libraries and the library services. The Open Source revolution has took place then those communities which wanted to help organizations and people with free software. They developed Open Source Software and then the Open Source revolution took place. These particularly, Open Source Library Automation Software came very handy to medium and small libraries. They started applying Open Source Software. Thus you know, Open Source Software has gained importance for Library Automation for libraries. Since the Open Source Software also had many advantages and libraries particularly, those could not effort Proprietary Software. They had shown their interest and they felt very much obliged with Open Source revolution and they have really perceived the advantages of Open Source Software. Thus, Open Source Software has importance and how and why Open Source Software gained importance.

1. **IMPORTANCE OF OPEN SOURCE SOFTWARE (OSS)**

1. **Open Source Software is free:** The OSS is available through internet with free of cost and license free software, anyone can use it for any purpose. Source code is free to use, modify, and redistribute as long as all uses, modifications, and redistributions are similarly licensed.
2. **Open Source Software provides Source Code:** The OSS source code is freely available and can be modified the program source code to their users own needs and the most important aspect of the Open Source movement is participation of many users and they develop the program source code for free, simply to improve the product and benefit to community.
3. **Maintainability:** Open source software is typically created and maintained by developers crossing institutional and national boundaries, collaborating by using internet-based communications and development tools;
4. **Intellectual Property Rights:** Intellectual Property Rights to open source software belongs to everyone who helps to build it or simply uses it, not just the vendor or institution that created or sold the software.

5. **Open Source Software has customer support system:** Open-source software is often highly customizable meaning that it can be modified to fit the specific needs of the user since they have access to the initial code.
6. **Efficiency:** OSS development does not depend on single person or community. It spread across the world due to collaborative development of OSS. The new version released frequently that can be made available to the user community. Efficiency measures performance of OSS applications and eliminating errors of previous developer and modifying the source code, maintenance and refine the software.
7. **Usability and User Friendly:** Generally, closed-source software offers a much better user experience because of the lack of friendly user interfaces with open-source solutions. Ultimately, usability depends on the proficiency of each individual user with either type of program. Since people pay for closed-source programs owners tend to prioritize making them as easy and enjoyable to use as possible
8. **Compatibility:** When programming proprietary hardware with open-source solutions, it is often necessary to obtain specialized drivers that are usually only accessible from the original manufacturer.
9. **Open Source Software is as good as Proprietary Software:** The OSS is as good as Proprietary Software. There are three major differences i.e. 1. Price 2. License 3. Software Development.

1. **1) Price:** Open-Source Software available through internet with 'free' of cost, simply download the software and use it according to the user applications. There are no charges for use, edit, copy and distribution. The charges are required only for media, documentation, and support etc. It is anti-commercial and license free software.

   2) License: The Open-Source and Proprietary Software, both source code is protected by a license; there are some fundamental differences between a proprietary license and an open-source license. While a **Proprietary** license makes users agree that they won't do to the software anything that's not expressly allowed in the license and where as **Open-Source** license states the terms under which users can change and further use the code.

   3) Software Development: Proprietary Software is created and modified by one or more teams within commercial companies leaving the proprietary code behind it known only to them and unrevealed to the users. On the other hand, **Open-Source** code is created through community-driven development. In this approach, developers are encouraged to look at, analyze, modify, debug and improve the open-source code. The number of people taking part in creating the

software is not limited to those working in one organization but is open to anyone capable and willing to share their knowledge.

10. **Vender Lock-In:** Vender lock-in is major issue in Proprietary Software where as OSS allowed libraries to reduce their initial and ongoing cost that eliminates the vender lock-in and it provides greater flexibility.

2. OPEN SOURCE SOFTWARE (OSS) - ADVANTAGES AND DISADVANTAGES

The Open Source Software packages' are much popularity in today's world of library automation and it is also available for various library services. Therefore, librarians perceived the advantage and disadvantages of Open Source Software for library automation.

2.1 Open Source Software (OSS)

At present, Open Source and Libraries play an important role in development of software applications. They provide developers with wide range of tools and resource that can help to create high quality software quickly and efficiently. The Open Source refers to source code, the human-readable computer code which is origin or source of the computer application. Open refers to the terms of access to the computer source code. Therefore, the OSS is software to which the source code is freely available. The most important aspect of the Open Source movement is participation of users. The OSS can modify the source code or program to theire own needs. Many users will help to develop the program for free, simply to improve the product or source code and benefit to community. The OSS provides source code to users to look-at and modify freely. The term software has two different related things.

They are 1) Source Code, and 2) Object Code

1) ***Source Code:*** A set of human-Readable and understandable instructions that comprise the 'recipe' from which an executable program can be made.
2) ***Object Code:*** The actual executable program which is compiled of machine readable source code. It is fed into a computer microprocessor to perform various operations.

However, Open Source Software (OSS) stated that it gives users freedom to run the program for any purpose, to study and modify the program, and to redistribute copies of either the original or modified program withouthaving to pay royalties to previous developers. It offers more flexibility and freedom than software purchased with license restrictions. Both the open source software programmers and theuser community share and promote open standards and believe in sharing. The Open Source Software (OSS) for library automation has revolutionized change in the library housekeeping operations and services. It provides many tools and modules for building automation libraries and value added services to their library users. Open source

promotes software reliability and quality by supporting independent peer review and rapid evolution of source code.

2.1.1 Open Source Software Definition:

The Open Source Software defines "Open source software is software thatcan be freely used, changed, and shared (in modified or unmodified form) by anyone. Open source software is made by many people, and distributed under licenses that comply with theOpen Source Definition (http://www.opensource/)".

According to OSI (Open Source Initiatives, 2003 a) "Open Source promotes software reliability and quality by supporting independent peer review and rapid evaluation of source code to be certified as Open Source, the license of a program must guarantee the right to read, redistribute, modify and use it freely."

2.1.2 The distribution terms of Open- Source Software must fulfill with the following criteria:

Source Code	The source code should be easily accessible, freely downloadable through Internet and distribution of source code in compiled form. Deliberately obfuscated source code is not allowed.
Free Redistribution	The license shall not restrict any one or any purpose to download the OSS as a component of aggregate software and the license shall not require a royaltyor other fee.
Derived Works	The derived works have license free, must allow modifications and distributed under the same terms as the license of the original software.
Integrity of the Author's Source Code	The license must explicitly permit distribution of software built from modified source code. The license may require derived works to carry a different name or version number from the original software.
No discrimination against fields of Endeavour	The licenses must not restrict anyone for making use of the program in a specific field of endeavour.
No discrimination against persons or groups	The license must not discrimination against any persons or group of persons.

Distribution of License	The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.
License Must Not Restrict Other Software	The license must not place restrictions onother software that is distributed along with the licensed software.
License Must Not Be Specific to a Product	The rights attached to the program must notdepend on the program's being part of a particular software distribution.
License Must Be Technology-Neutral	No provision of the license may be predicated on any individual technology or style of interface.

2.2 Open Source Software (OSS) and its Advantages

The opensource software is developed in collaborative manner in a public for non-profit and license free software. OSS has provides many advantages some of them listed below:

2. **Less Software costs:** Open-Source Software available on internet and freely download. It is license free software. There are no charges for use, edit, copy and distribution. The charges are required only for media, documentation, and support etc.
3. **Quality and Reliability:** The Open Source Software has more quality and reliability compare to Proprietary Software. It promotes software reliability and quality by supporting independent peer review and rapid evolution of source code.
4. **Security and Stability:** The OSS provides the greater security and stability by communal developing source code. ***Security;*** The OSS has provides more secure than Proprietary Software used in the library automation and it also provide constant reviews by a large community of developers. ***Stability;*** As the software code is publicly distributed, users can trust it for their long-term projects - safe in the knowledge that developers cannot simply terminate support or neglect a vital update.
5. **Adaptability and Customization**: The OSS provides the easy to adapt the software with free licensed and customization. ***Adaptability;*** It allows adapting of software product to the needs of a specific users or a user group. ***Customization;*** Open-source software is often highly customizable meaning that it can be modified to fit the specific needs of the user since they have access to the initial code.
6. **Freedom to Use and Flexibility:** The Open Source libraries are collections of pre-written code, that developers can use to build the software application and OSS provides ***freedom to use*** the software without any restrictions. ***Flexibility;*** The OSS for library applications it gives more flexibility than Proprietary Software used in the libraries. It allows the developers to

customize than to meet their specification needs.

7. **Cooperation and Community:** The Open Source Software (OSS) development does not depend on single person or community. It spread across the world due to collaborative development of OSS. The new version released frequently that can be made available to the user community.
8. The OSS does not depend on any specific Hardware, Operating System or any platform to its functions.
9. The OSS provides number of copies of programs on their machines to the people at work place or at home.
10. The OSS provides source code to edit, modified and redistributed according to user requirement.
11. The OSS incorporates the software in to another program to perform new functions.
12. The OSS development does not depend on single person or community it spread across the world due to collaborative development of OSS. The new version released frequently that can be made available to the user community.
13. The OSS provides open standard data formats. There is no data loss hence it is easy to retrieve the data for future use.

2.2 Open Source Software (OSS) and its Disadvantages

The Open Source Software (OSS) also contain certain disadvantages, such as:

1. The major disadvantages of OSS are Lack of Support and Training where as proprietary or commercial software offers both support and Training.
2. The OSS provides support only through mailing list and discussion forums.
3. Technical knowledge required for installing and maintenance of OSS.
4. It is difficult for known about OSS and easy to use and its function ability.
5. The Documentation manuals are not available to known about OSS.
6. The OSS is not possible to know the live or dead/die.
7. No guaranty development will be happened.
8. Structural quality issues with source code.

3. OPEN SOURCE SOFTWARE (OSS) FOR LIBRARY AUTOMATION

The Open Source Software (OSS) packages are gaining much popularity in today's world of Library Automation. The Open Source Software (OSS) provides an opportunity for library automation applications to take control of library services and collection relaying on available hardware with libraries. The Open Source Software (OSS) applications for library automation

it increases the library values and enhances the library services.

The most important use of Open Source Software (OSS) for library automation as follows:

1. The Open Source Software (OSS) can be used in libraries to provide new value added services to the end users without any requirement of large budget.
2. Customer Support Services is provided by the OSS for library applications.
3. The OSS features associated with the house keeping operations of library.
4. The OSS can be shift- over from existing to new software packages.

3.1 Library Automation and its features

Library Automation is mechanization of computer applications in library housekeeping operations for easily working and saving human power and time. The purpose of library automations is to provide a search facility of databases, provide current information to users on request, have a control over budget, avoid duplicate purchase of books, have an effective control over books sent for binding, missing books etc., attain the web 3.0 services, have interoperability with other libraries and help in saving time, space, energy and resources.

The following are the important features of OSS for Library Automation:

1. Software, self-check machines, and other applications and Search/Retrieve via URL and Z39.50 servers.
2. Housekeeping modules, Full acquisitions system including budgets and pricing information and Simple acquisitions system for the smaller library
3. Ability to cope with any number of branches, patrons, patron categories, item categories, items, currencies and other data Serials system for magazines or newspapers
4. User friendly web interfaces for librarian and users and Import and export of bibliographic records in different formats.
5. Tagging and comments on the OPAC, Multi language support, Persistent URLs and Work-flow as per Indian Libraries

The Open Source Library Automation Software (OSLAS) is help to libraries than investing on commercial software and it provides value added service to users. The Open Source Library Automation Software have several features and using these features, any library can go for complete library automation with the latest web 3.0 applications in libraries.

The mostly available Open Source Software for Libraries Applications:

1) Open Source Integrated Library Automation Software (OSILAS): Koha and NewGenLib,
2) Open Source Digital Library Software: Dspace and Greenstone etc.
3) Open Source Content Management Software: Drupal and Zoomla etc.

4. RISK FACTORS IN OPEN SOURCE SOFTWARE (OSS)

Technology application is a serious problem for libraries and they are not for profit making. With the rising cost of technology application in libraries are very difficulties in day to day. Librarians seem to better way of smooth functioning of libraries and give quality services to the users. Librarians it's a challenging task where they are need to balance the library smooth functioning, manpower and money. The risk factors that may be heavily affect on execution of Open Source Software in the libraries.

1. **Data security:** Protecting data from unauthorized access or manipulation of data in the database. The open source software are available freely to all those who wants to use. It is highly difficult to have control over the data and unauthorized persons may hack the data easily in the open source software scenario.
2. **Lack of Skills:** Skilled persons are required to execute and implement the OSS in proper manner. Lack of software technology skills among the library professionals is another major risk in implementation of OSS in the library environment.
3. **Training:** Adequate training is prerequisite for the success of OSS among the working professionals. It is also one of the risk factors that how to train the library staff on operational modules of OSS.
4. **Up-gradation:** To upgrade to the new version with the existing source is quiet difficult. The risk of Data migration and compatibility are matter in this level.
5. **Installation and Customization:** Library professionals may not have IT skills sufficient for installation and customization of software which makes implementation more a complex process. The basic knowledge of IT may not help in customizing open source software and it requires programming and IT expert involvement in the process.
6. **Support:** Another major risk in open source software environment is, support from the developers or vendors for solving problems at installation level, implementation level and thereafter. Some of the commercial developers and vendor are there to support but the charges are too high.
7. **Sustainability**: Prediction of future development in open source software is not simple or easy. Sustainability of OSS and its future is not guaranteed, any time anything may happen, like software may crash, errors may occur and software bugs may affect the program. Sustained support from the IT experts is the major risk.

5 CONCLUSIONS

The Open Source Software packages' are much popularity in today's world of library automation and it is also available for various library services. This study focused on Open Source Software (OSS) and their importance for libraries. Librarians identify the importance of OSS for libraries and its advantages and disadvantages, and risk factors assisting automation of library house-keeping operations etc. Librarians can equip themselves to implement the Open Source Software (OSS) successfully in the libraries such as Koha and NewGenLib for Library Management System, Dspace and Greenstone for digital library, Drupal and Zoomla for content management.

6. REFERENCES

1. *Christian Payne (2002). On the security of open source software Information Systems Journal;12(1), p 61–78.*
2. *Griggs, Kim. (2009). Library Information Made to Order: An Open source software Project Built for and with Librarians. Computers in Libraries; 29(2), p13-14.*
3. *Joel West, Scott Gallagher (2006). Challenges of open innovation: the paradox of firm investment in open-source software. R&D Management; 36(3) p319–331.*
4. *Mickey, B. (2001). Open source softwares and Libraries: An Interview with Dan Chudnov. Weston Then Wilton; 25(PART 1),p23-29*
5. *Piva, Evila; Rentocchini, Francesco; Rossi-Lamastra Cristina (2012). Is Open source software, Software about innovation? Collaborations with the Open source software Community and Innovation Performance of Software Entrepreneurial Ventures; Journal of Small Business Management, 50(2), p340-364.*
6. *Rapp, D. (2011). Open source softwares Reality Check: Believe the hype or not, implementations of open source softwares integrated library systems have been rocky, Library Journal; 136(13), p34.*
7. *Rochkind, Jonathan (2008). A Primer in Risk. Library Journal; 133(19), p22-25.*
8. *Ukachi, B. (2012). "Awareness, Availability and Utilization of Open Sources Software in Nigerian Libraries: the way forward. International Research Journal of Library, Information and Archival Studies, 2 (1), 001-009. vailable:http://interesjournals.org/IRJLIAS/Contents/2012%20content/January.htm.*
   (January 27, 2013)Look at the Numbers! http://www.dwheeler.com/contactme.html Accessed on 14/10/
9. *Open sources software. Definitions. Available at: http://en.wikipedia.org/wiki/open_spurce_Software.*
10. *Vaishali N. Aher , Praveen J. Pandit and Dr. T. R. Borse (2016), CLOUD COMPUTING AND LIBRARY AUTOMATION: AN OVERVIEW ". IJIRSE: International Journal of Innovative Research in Science and Engineering, Vol. No. 02, Issue No.03, March 2016, www.ijirse.com.*
11. *Tyagi, Nidhi Passi, Sumit Kumar Baberwal (2015), "CLOUD COMPUTING & IT'S APPLICATIONS IN LIBRARY SYSTEMS". IJRET: International Journal of Research in Engineering and Technology, eISSN: 2319-1163 | pISSN: 2321-7308.*
12. *Müller, Vincent C. and Bostrom, Nick (2016), 'Future progress in artificial intelligence: A survey of expert opinion', in Vincent C. Müller (ed.), Fundamental Issues of Artificial Intelligence (Synthese Library; Berlin: Springer), 553-571.*
13. *N. J. Nilsson, Principles of artificial intelligence. Morgan Kaufmann,2014.*
14. *Open source software. Wikipedia. Retrieved February 5, 2008, from Web site: http://en.wikipedia.org/*
15. *http://www.liblime.com/open-source/why-yourlibrary-needs-open-source*
16. *http://www.opensource/*
17. *http://opensource.org/osd*
18. *http://en.wikipedia.org/wiki/Open_source_software_security*
19. *http://www.slideshare.net/stellacomans/open-source-integrated-library-systems*