Library Automation and Use of Open Source Software to Maximize Library Effectiveness

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Abstract

Automation of library services and the use of open source software are essential for efficiency and effectiveness and at a minimal cost, too. Library automation benefits both the library staff and the users as it reduces the level of job stress on the staff and enhances remote and timely provision of up-to-date information to the users. This literature based opinion paper majorly aimed to establish the relevance of using open source software in library automation. To achieve this goal, the paper was divided into sub-headings that respectively highlighted the relevance of library automation, spelt out the salient issues to consider in library software selection, discussed the characteristics of OSS that qualify them to be effective library automation software, and enumerated and briefly discussed the various OSS available for integrated library management. Recommendations on the key factors that should be prioritized for the achievement of a successful automation of the library services with the open source software is equally made in the paper.

Keywords: Library automation, Open Source Software, Library effectiveness, Software selection criteria.

Introduction

The relevance of the application of information and communication technology in library activities such as acquisition, cataloguing, circulation, serials management, etc is no longer debatable as libraries globally have realized the need to move from their isolated past into integrated systems and networked operations. Recent developments in information handling processes have also obligated libraries to embrace automation as a means of enhancing their service delivery to their clientele. According to Lubanski (2012) automation simply means "the use of machines or technologies to optimize productivity in the production of goods and delivery of services". Aina (2004) opined that automation involves the computerization of routine tasks hitherto being performed by human beings. Library automation therefore is a process of applying or utilizing ICT facilities to perform those tasks that are traditionally performed manually in the libraries such as acquisition, cataloging, circulation, serials management, etc. Library automation requires the utilization of hardware and software. This makes it very important that a discussion on library automation should not be done in isolation of library software. Library software come in two different models- the Proprietary software (those that require the payment of subscription fee) and the Open Source Software (OSS).

During the era proceeding the advent and development of Open Source Software, it was universally recognized that very few libraries were able to acquire software as a result of their overall high cost. Libraries at that time spent futile years planning and preparing for the automation of their services as a result of the exorbitant cost of software and hardware including the training of library staff and users. Presently, access and acquisition of these software are achieved with little or no fund via the Open Source Software Initiative. According to Ukachi (2012) the advent and development of Open Source Software in the present age, has made the transition from "traditional" to "technology based" library services, which gives room for more efficient service provision, very easy and cost effective hence, libraries are now adopting them in their technical services, digitization processes, and general library management. Open Source Software (OSS) are computer software that are produced by Programmers and made available to the general public with their source codes and relaxed copyright restriction and also allows modification by users in line with their needs, requirements, and purpose of usage. These software, in addition to being effective, are most often acquired free of charge. This implies that those factors such as exorbitant cost of proprietary software and library budgetary constraint which in the past, had restricted

library automation to exclusively well-funded libraries, is being eradicated by the advent of OSS. It could also be said that while automation enhances library service delivery, OSS enhances library automation.

However, while libraries in the developed parts of the world are fast embracing and adopting the use of OSS in their library automation, those in the developing nations are yet to fully embrace them for fear of their efficiency and effectiveness. This identified information need on the efficacy of OSS gives room to ask such question as: What are the characteristics of OSS that outstandingly qualify them to be effective library automation software? Consequent upon the above, the main objective of this paper is to establish the relevance of using OSS in library automation. The specific objectives are to:

➢ Highlight the relevance of library automation
➢ Spell out the salient issues to consider in library software selection
➢ Discuss the characteristics of OSS that qualify them to be effective library automation software.
➢ Enumerate and briefly discuss the various OSS available for integrated library management.

Relevance of library automation

Libraries presently are confronted with issues which cut across; geometrically progressive information growth and shrinking space, change in users' information behaviour, means of organizing the flood of information, Cost hike of printed reading materials and need for resource sharing. The need to overcome these issues and also make the library more efficient and effective in their service delivery, makes automation of library services imperative. The traditional method of managing the library is no longer efficient as the use of computers and other technologies is conventionally adopted to enhance services provided by the library. Library automation enhances the speed, productivity, adequacy and efficiency of the library staff. Time and the manpower that could be expended in performing some technical and readers services routine and clerical tasks such as filing, sorting, duplicating, etc, are conserved when the library is automated. According to Aswal (2006), library automation is pivotal to library effectiveness because it increases staff productivity, enhances housekeeping operations, enables advancement in technology, and enables access to external information through the Internet. Sudhamani (2010) supporting the above enumerated the following as relevance of library automation

➢ It improves the quality, speed and effectiveness of service
➢ Improves access to remote users
➢ Facilitates wider dissemination of information products and services
➢ Facilitates resource sharing among libraries
➢ Enables rapid communication with other libraries
➢ Improves the management of physical and financial resources
➢ Facilitates generation of reports for better decision making and effective management of the library

It is in line with the above that Neelakandan, Duraisekar, Balasubramani, and Srinivasa Ragavan.S (2010) also stated that for expeditious retrieval and dissemination of information and better services to the clientele, application of modern techniques in the form of automation has become absolutely indispensable. An automated library will help its users with quick, accurate and prompt services. Automating the information available in the library benefits both the staff and users alike.

Generally, automation of library services is relevant as a result of the following:

a. **Improves access:** Automated libraries enable faster, more efficient and more comprehensive searches. It retrieves and sorts materials using the varying access points such as: the title, author, International Standard Book Number (ISBN) numbers, keywords, publisher and publication date by mere simple mouse clicks. Posting the electronic catalog on the Internet also enables easy access to the library holdings.

b. **Improves the quality and effectiveness of services to remote users**: Automation improves library services in line with new forms of learning, such as e-learning and distance education. It enables libraries to satisfy the demand for ready reference/information services.

c. **Saves professional manpower time**: professional staff time that could have been spent in performing routine and repetitive technical works such as bibliographic verification/searching, order placement, checking duplicates, charging and discharging of records as well as cataloguing jobs are saved in an automated library environment.

d. **Facilitates wider dissemination of information products and services**: it gives room for users even from remote areas to access the library resources and also enables easy and timely provision of such services as Current Awareness (CA) and Selective Dissemination of Information (SDI).

e. **Resource-sharing among libraries (Union Catalogues):** Automated cataloging standards, such as MARC (Machine Readable Cataloging), allow for quicker cataloging of library items and also makes

the sharing of materials among libraries much easier and much more affordable. It enables consortium formulation and makes library collaboration very easy.

f. **Control and management**: Automation enables library staff to circulate materials with ease, accurately track individual users' transactions, and enables users to do self-charging and discharging. Automation also facilitates periodic stock inventories without having to suspend library operations. It gives room for improvement in the variety, amount and quality of materials that are available in the library's collection. It also helps make weeding out outdated and irrelevant books and materials from the collection, which helps keep the library's collection more streamlined and easier to find the right item.

Issues to consider in library software selection

Selecting the right software for an organization or institution such as the library could be a challenging task considering the fact that organizations adopt these technologies with the aim of: increasing their productivity, addressing operational challenges, increasing their level of competitiveness and reducing their cost of operation. The inability to have a proper strategy in place for selecting the right software could significantly hamper the efforts towards achieving these goals. Selecting the wrong software can lead to long-term maintenance costs, absence of use or under-utilization of the system by the users hence, it is important that software are critically evaluated before a selection is made. Belyk and Feist (2002) documented that the key issues to consider in selecting software include; the Cost, availability of technical support (user manual; frequently asked questions; online and offline help), Collaborative tools (Asynchronous – email, conferencing; Synchronous – chat, audio- conferencing, whiteboard, virtual networking; Isosychronous – desktop video-conferencing), ease of use, functionality, security issue (password protection; encryption; firewall), Clarity (Resolution, sound, size, layout, etc.), Interoperability, Scalability, Integration and File-sharing features and administrator tools (registration; report generation). Oketunji (2006) cited by Udoh-Ilomechine and Idiegbeyan-ose (2011) also emphasized that issues such as: hardware connections, your right in respect of the software, history of the supplier, possibility of preview or demonstration, pricing structure, level of sophistication, support issues, references sites, parameterization, teaching aids, system administration, and needs for documentation should be critically examined when selecting a software.

FedSolutions (2012) emphasizing the need to be careful when selecting software, also listed 10 criteria for selecting the right software for an organization. These criteria are as follows:

1. What is the need for this application software?

Identify the purpose for which you need the software. Example: having a need for an integrated tool that would allow a group of up to 30 researchers to gather, authenticate and report their study data.

2. Identify your priorities.

It is important to understand the capabilities of the various products and how they can benefit your organization. For example, if there is a need to install the software in a centralized location, and make it available for study groups, or researchers to use and access data from the field, it will be pertinent that such software are able to export data and input and report data also. Prioritizing your needs and implementing the right software for your needs is most critical.

3. Mission Critical vs. Business Critical.

What is the mission? Is it a mission critical or business critical application? A mission critical use is serious to the operation of your business. If the application flops or is inaccessible within a certain length of time, it could be damaging to your business, such as financial software errors. A business critical application is critical for your personnel to perform their obligations and responsibilities. A credible vendor should be able to enlighten you on this.

4. Vendor Credibility and Longevity

It is important to know the vendor's history and credibility. What are their customer dependability and satisfaction ratings? Don't focus completely on the negative aspect but be analytical. Spend time and check references on the vendor, so you don't get stuck in the cold if something were to go wrong. A solid warranty is something to look out for and ask about.

5. Software Reliability

Are there any issues with the software going offline or any technical glitches? What is the length of time for issues to be resolved? Does the time slot given to resolve issues fit in line with your activity? Research online forums and even make a call to other customers to get a realistic idea of what you're really getting yourself into. Speak with previous customers and find out why they abandoned or upgraded to another application.

6. Operations Integration

How does the application fit in with your current needs? Does is streamline processes and save time? Who will use it? Where? When? How? Cultivate a plan for implementing the software into your current procedures. Be

precise in regard to who will use the application and how they will use it. Ensure that the software application abilities will meet your current organizational need. For example, if you need employees to contact the application remotely, will this feature be available?

7. Support Model

How well does technical support work if your employees were to encounter an issue? Does the merchant provide phone support or support via email only? What is the average reply-time for answering technical issues? Is there adequate documentation and information available? Are there any hidden fees for extra support?

8. Scalability for Growth

Will the application be beneficial as your organization grows? Will there be an increased pricing if your organization grows? Ask questions to know if there will be license issues when adding users.

9. Pricing

Once you have reviewed the pricing and have evaluated the merchant, product competencies and resolved that the application is good, you can then look at the price. The pricing should reflect and support the capabilities, measuring up to the level of support offered.

10. How Will You Measure the Return On Investment (ROI)?

Ask yourself how this investment will reduce your immediate and long-term cost. Figure out how to measure the return on your investment before signing on the dotted line on the contract. Will the application or product replace an existing application that is more costly? Will the quality of work improve with the system being put in place?

However, considering that the strength of an automated system is mainly dependent on the application software being utilized, selecting the right library management software is then very important. When selecting library automation software, one must ensure that it will work well with the existing equipment in other to reduce cost accruable from acquiring new facilities. An exhaustive analysis of the librarians' workstations and patrons' access points should be carried out and the various available software critically evaluated.

More so, to carry out these selection duties, a library automation committee should be constituted to include library and computer software/ hardware experts. A list of the library's areas of activities, services and functions which are to be automated should be prepared. A profile of the available library software should also be made. Consultation on the functions and reliability of the software with similar organizations/libraries which have already automated their services should be done. It should be noted that the experiences of the other librarians who have used the software are more valuable than the assurances of the manufacturers. The flexibility, capacity, expandability, security, cost effectiveness, user's friendly, module based and ability to be updated with the latest technology capability of the software should be prioritized when selecting a software.

The specific selection criteria that should guide the choice of open source software are as follow:

i) User friendliness

ii) Portability

iii) Well designed screens, logically arranged functions with extensive help messages

iv) Minimal training

v) Multi-user and unlimited user access

vi) Multilingual & Multimedia supported

vii) Supporting Internationally known standards (MARC, AACR-2, Dublin core, Z.39.50, etc)

viii) Training and Support (E-mail, Discussion Forums)

ix) After installation service availability and,

x) Cost of installation

Characteristics of Open Source Software that qualify them to be effective library automation software.

Open Source Software which according to Engard (2011) are applications whose source code is made available for use or modification in line with users' needs and requirements are known with some Characteristics which make it distinct from proprietary software. According to gbdirect (2011) the characteristics include:

Source Code: These software come with the source code, and allows distribution of same. Where some form of the product is not distributed with the source code, there is a well-publicized means of obtaining the source code which is usually downloading it via the Internet without charge. The source code is provided in the form in which a programmer would be able to modify the program. Obscure source codes or Intermediate forms such as the output of a preprocessor or translator are not allowed for OSS.

Free Redistribution: The license does not restrict any party from redistributing or giving away the software as a component of an aggregate software distribution containing programs from several different sources. The license does not require a royalty or other fee for such distribution.

Derived Works: The license allows modifications and derived works, and also allows them to be distributed under the same terms as the license of the original software.

No Discrimination against Persons, Groups and Fields of Endeavor: The license does not discriminate against any person or group of persons. It does not also restrict anyone from making use of the program in a specific field of endeavor. For example, it does not restrict the program from being used in a business, or from being used for genetic research. It is meant for everyone and, in every field of endeavor.

License Must Not Restrict Other Software: The license does not place restrictions on other software that is distributed along with the licensed software. For example, the license does not insist that all other programs distributed on the same medium must be open-source software.

License Must Be Technology-Neutral: The provision of the license is never predicated on any individual technology or style of interface.

Benefits of Using Open Source Software

Numerous benefits such as cost effectiveness, interoperability, user friendliness and the ability to modify the software to suit any specific function desirable by the user, can be derived from the use of OSS. Muffatto (2006) noted that one of the main benefits of open source software is the commitment of the community to develop something that is interoperable and respects open standards. Tennant (2007) added that the advantages of open source technology are that it is flexible and has the ability to build a complex system at less cost. Emphasizing the cost effectiveness of OSS, Clark (2008) affirmed the advantage of open source in terms of saving money on a library system and for support costs. However, Gonzalez-Barahona (2000) stated that the benefits associated with the use of OSS range from philosophical and ethical reasons to pure practical issues. He further summarized the practical benefits as follow:

Reliability: Open Source Software could be said to be reliable because it does not manifest defects which can cause incorrect operation, data loss, sudden failures, or failure to meet specification or appropriate published standards which is generally termed as 'bug'. This is not to say that problems are never encountered with the use of OSS but, each problem is usually addressed with speedy fixes, a process which is undoubtedly assisted by the availability of the source code. Hence, Open Source advocates claim very rapid time-to-fix characteristics for software. The pattern with closed-source software is typically that a defect report needs to be filed and then there will be a delay before the vendor determines when or whether to issue an updated release. Users of the closed-source software are much more at the mercy of the vendor's internal processes than with the Open Source arrangement.

Stability: Proprietary 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 such software is that they rarely have much control over that process and are left isolated if they choose to remain with the older versions. This has cost and control implications for the business whereas with OSS, the worst effects of vendor-push can be mitigated. Having access to the source code can allow a business to choose to support itself on an old version where necessary thereby giving more options and choice to the users.

Auditability: A rarely-understood benefit of Open Source software (any software where the source code is published) is its auditability. Closed-source software forces its users to trust the vendor when claims are made for qualities such as security, freedom from backdoors, adherence to standards and flexibility in the face of future changes. If the source code is not available, those claims remain simply claims. By publishing the source code, authors make it possible for users of the software to have confidence that there is a basis for those claims. Without access to the source, third party inspection is impossible.

Cost: Most Open Source software are provided free of royalties and fees. Administrative overhead cost is drastically minimal as there is no cost attached to number of copies in use, unlike when proprietary software is used. There is also lower management cost as no upgrade fees are incurred. Near-zero vulnerability to viruses eliminating need for virus checking, data loss and downtime

Flexibility and Freedom: This software is flexibility as it gives users opportunity to be able to choose solutions suitable for their needs. Open Source software offers its users greater freedom to purchase other products, avoiding lock-in to particular manufacturers. Freedom from a single vendor and freedom to modify your software

Open source software available for integrated library management.

Quite a number of open source software are available for automating the various library functions. Below are some open source software that can be used for integrated library management.

a. **KOHA Software-** The name Koha comes from a Maori term for a "gift" or "donation". The development of Koha began in 1999, funded by a group of libraries in rural New Zealand that found proprietary software expensive and lacking some needed features. The full featured Koha was developed initially in New Zealand by Katipo Communications Ltd and first deployed in January, 2000 for Horowhenua Library Trust. Koha is designed to work with a minimum of hardware resources. It runs on the Linux operating system in conjunction with the Apache Web server, uses the popular MySQL open source database management system, and is written in Perl. The Koha ILS can also be installed on Windows operating system but with a series of additional modules. Migration of data from one ILS to Koha can be done easily.

Some of the key features of Koha listed by EIFL-FOSS (2013) include:

➢ Web Based Interface
➢ Copy cataloguing and Z39.50 compliant
➢ MARC21 and UNIMARC for professional cataloguers
➢ Manage online and off line resources with the same tool
➢ RSS feed of new acquisitions
➢ E-mail and/or txt patron's overdue and other notices
➢ Print barcodes
➢ Serials management module
➢ Full catalogue, circulation and acquisitions system for library stock management
➢ Web based OPAC system
➢ Simple, clear search interface for all users
➢ Simple and comprehensive acquisition options
➢ Multi-tasking and enables updates of circulation, cataloguing and issues to occur simultaneously.

The software is available at http://www.koha.org while the Mailing list URL is: http://koha.org/mailing/.

b. **Evergreen Software-** This is an open source Integrated Library System (ILS). It includes circulation and cataloguing features, OPAC, SIP2.0 support for interaction with software administrator and search/retrieval through Z39.50.

Evergreen also features the Open Scalable Request Framework (OpenSRF, pronounced 'open surf') that allows developers to create applications for Evergreen with a minimum of knowledge of its structure. It operates on Debian or Ubuntu Linux servers. It is operable in English and issued under a GNU General Public License (GPL)

Evergreen software features include:

➢ Circulation: for staff to check items in and out to patrons
➢ Cataloging: to add items to the library's collection and input information, classifying and indexing those items.
➢ Online public access catalog (OPAC): a public catalog, or discovery interface, for patrons to find and request books, view their account information, and save book information in Evergreen "bookbags." Acquisitions: for staff to keep track of those materials purchased; invoices, purchase orders, selection lists, etc.
➢ Statistical Reporting: flexible, powerful reporting for retrieval of any statistical information stored in the database.
➢ SIP 2.0 support: for interaction with computer management software, self-check machines, and other applications.
➢ Z39.50 compliant
➢ Available for Windows & Linux
➢ Easy to install and maintain

The software is available at: http://evergreen-ils.org/downloads.php, Software support URL is: http://www.evergreensys.com/support/contactsupport/ while the Mailing List is at: http://evergreen-ils.org/listserv.php.

c. **ABCD Software-** ABCD, which in full is, "Automation of liBraries and Centres of Documentation" is operable in English. The name itself already 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 is developed by BIREME (WHO, Brazil) in collaboration with the Flemish Interuniversity Council, Belgium, using UNESCO"s ISIS database technology. This software provides flexibility and versatility. It covers all the major functions in a library such as:

> ➤ Acquisitions
> ➤ Bibliographic database management
> ➤ User management
> ➤ Statistical Reporting
> ➤ Serial control
> ➤ Online end-user searching
> ➤ Z39.50 compliant.

 The software is available at: https://sites.google.com/site/abcdlibraryautomationsoftware/downloads. it is available for Linux and the tutorial can be seen at: https://sites.google.com/site/abcdlibraryautomationsoftware/downloads/tutotials-help-files

d. **WinISIS** (formerly CD/ISIS)- WinISIS is a Windows version of the CDS/ISIS system (Computerized Information Service /Integrated Scientific Information System) which was developed because CDS/ISIS was not compatible with the WINDOWS operating system. It originated at ILO and is developed by UNESCO. The first Window version of CDS/ISIS was distributed for testing in May 1995 and the first WinISIS version officially realized was version 1.31 launched in November 1998. It can run on a single computer or in a local area network.

It is available at: http://www.unesco.org/isis/files/winisislicense.html

e. **NewGenLib**- This 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. The latest version of NewGenLib is 3.0.4 R1 released on 13 September 2012.

According to Haravu (2009), NewGenLib has the following main modules:
> ➤ Acquisitions
> ➤ Technical Processing
> ➤ Serials management
> ➤ Circulation
> ➤ Administration
> ➤ MIS Reports
> ➤ Task to do today (daily scheduler)
> ➤ OPAC

Some advanced functional features of NewGenLib include:
1. Android mobile and tablet capable
2. Integration with Twitter helping send messages of transactions directly to users' Twitter accounts.
3. Flexibility of defining own search field in OPAC.
4. Enhanced contents and interactive OPAC like Availability of Book jackets, Google preview, Comments/ Book review, Tagging, Favorite reading list, etc
5. Zotero compliant OPAC
6. RSS Feeds in OPAC
7. Faceted Browsing (Refining search results)
8. Suggestion for other books in the rack
9. RFID supports
10. Provision for frequently used predefined templates along with freedom of defining own customized data entry template s in Cataloguing
11. Configurable SMS system - a proof of transaction.
12. Integration with Gmail or paid mailbox account. This enables automatic sending of email to patrons during issue /return.
13. Enhanced Report Module for generating in .csv format with a provision for wide customization.
14. Provision for integrating with Vufind SOPAC (Ex: OPAC of the Library of Bangalore University).
15. Catalogue can be harvested through Google site map, and thus the visibility of the library can be further improved.

NewGenLib is available at: http://www.verussolutions.biz/euniversity.php

f. **Emilda-** This is a complete Integrated Library System that features amongst others OPAC, circulation and administration functions, Z39.50 capabilities and 100% MARC compatibility. MARC compatibility

is achieved using Zebra in conjunction with MySQL. Emilda is mainly written in PHP, but Perl scripts exist for MARC manipulation and shell interaction

It can be accessed at: http://sourceforge.net/projects/emilda/ or http://www.emilda.org/

g. **PMB (PhpMyBibli)-** This is a fully featured open source integrated library system. The project that led to the development of this software was initiated by François Lemarchand in October 2002, Director of the Public Library of Agneaux. It is now maintained by PMB Services (a French Company). PMB has most of the functional modules essential for a library management system. The development of PMB was started in October 2002 by a librarian, François Lemarchand. He prepared the bases of cataloguing and the skeleton of the application. Later on Eric Robert, Gautier Michelin, Florent Tetart, Armelle Nedelec joined the developers' group. In 2003, the project initiator François Lemarchand left the team. The last 3.0 version was launched in September 2006, and since then frequent release updates were made and new features added to the existing version.

The available modules in this software include: Circulation, Cataloguing, Reports, SDI (Selective Dissemination of Information Service) and Administration, and Acquisition.

The features of PMB consist of the following:

➢ User friendly web interfaces for librarian and users
➢ UNIMARC
➢ Z39.50
➢ Barcode generator
➢ Detailed documentation for users and administrators
➢ Active development status
➢ Interface for database back up and bibliographical records
➢ Multi language support (French, English, Spanish, Italian and Portuguese)
➢ Import and export of bibliographic records in different formats.
➢ Complies to Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH)

The software is available at: http://www.sigb.net/

h. **WEBLIS-** This web-based Integrated Library System is based on CDS/ISIS.

It is developed by the Institute for Computer and Information Engineering (ICIE), Poland, based on their experience in building library systems for international organizations such as FAO, IFAD and GTZ. WEBLIS runs through the WWW-ISIS engine. The current version of WEBLIS, available in English, consists of the following modules:

➢ Cataloguing system
➢ OPAC (search)
➢ LOAN module
➢ Statistical module

WEBLIS is available at: http://portal.unesco.org/ci/en/ev.php-URL_ID=16841&URL_DO=DO_TOPIC&URL_SECTION=201.html.

Conclusion and Recommendation

Library automation and the use of open source software are relevant for achieving optimal library effectiveness at a minimal cost. This process benefits both the library staff and the users as it reduces the level of job stress on the staff and enhances remote and timely provision of up-to-date information to the users. This paper has spelt out the salient issues that should be considered in library software selection and also discussed the characteristics of OSS that qualify them to be effective library automation software. Brief discussion on the various OSS available for integrated library management has also been done in this paper. To achieve a successful automation of the library services with the open source software, it is recommended that all key factors such as; consideration of user requirements, presence of the infrastructure (hardware, software, network), support from software developers, availability of user group for the software, and competent staff must be prioritized for the project.

References

Aina, L. O. (2004). Library and Information Science Text for Africa. Ibadan: Third World Information Services limited

Aswal, R. S. (2006), Library Automation for 21st Century. New Delhi: ESS ESS Publications. Pp5-8

Belyk, D. and Feist, D. (2002) Technical Evaluation Reports: 7. Software Evaluation Criteria and Terminology. *The International Review of Research in Open and Distance Learning*. 1 (1). Available: http://www.irrodl.org/index.php/irrodl/article/view/70/141. (July 27, 2013)

Bhardwaj, Rajesh Kr. and Shukla, R.K. (2000) A Practical Approach to Library Automation. Library Progress (International), 20 (1), pp.1-9. Available: http://www.rajweb.name/Publications/art1.pdf. (October 10, 2013)

Clark, J.R. (2008). The Internet connection: open source library software-ready for prime time? *Behavioral & Social Sciences Librarian,* 27 (3/4), pp.211-213.

EIFL-FOSS (2013) Koha (FOSS Integrated Library System). Available: http://www.eifl.net/koha-foss-integrated-library-system. (December 9, 2013)

Engard, N. C. 2011. Book review on "Practical Open Source Software for Libraries" by ARIADNE issue 66. Available: http://www.ariadne.ac.uk/issue66/rafiq-rvw/. (March 16, 2011)

FedSolutions (2012) 10 Criteria for Selecting Business Software. Available: http://www.fedsolutions.com/2012/10/it-support-10-criteria-for-selecting-business-software/ (September 10, 2013)

Gbdirect (2011). Benefits of Using Open Source Software. Available: http://open-source.gbdirect.co.uk/migration/benefit.html. (January 23, 2011)

Gonzalez-Barahona, J. M. (2000). Advantages of open source software. Available: http://eu.conecta.it/paper/advantages.html. (January 23, 2011)

Haravu, L J. (2009), "Comparison of two open source integrated Library Systems (ILS): Koha (version. 3.0) and NewGenLib (version. 2.2 beta)", Available: www.verussolutions.biz/files/Whitepaper2.doc. (August 20, 2012)

Lubanski, M. (2012) Building Clouds: building hybrid clouds that can support any device from anywhere. Available: http://blogs.technet.com/b/privatecloud/archive/2012/10/22/what-is-automation-by-michael-lubanski.aspx. (September 10, 2013)

Muffatto, M. (2006). Open source, a multidisciplinary approach. London: Imperial College Press.

Neelakandan.B, Duraisekar. S, Balasubramani.R, & Srinivasa Ragavan.S (2010) Implementation of Automated Library Management System in the School of Chemistry Bharathidasan University using Koha Open Source Software. *International Journal Of Applied Engineering Research,*1(1)Available: http://www.ipublishing.co.in/jarvol1no12010/EIJAER1014.pdf. (September 10, 2013)

Udoh-Ilomechine, Q. and Idiegbeyan-ose, J. (2011) Selection Criteria for Computer Software and Hardware: A Case Study of Six University Libraries in Nigeria. Chinese Librarianship: an International Electronic Journal, 32. http://www.white-clouds.com/iclc/cliej/cl32.htm. (July 27, 2013)

Sudhamani, K. S. (2010) Assessment and Evaluation of Open Source Library Automation Software KOHA and NewGenLib Adaptable to RGUHS Digital Library Operations and Functions. Being a report submitted to the Rajiv Gandhi University of Health Sciences in partial fulfillment of the requirement for the degree of a Postgraduate Diploma in Health Science Librarianship. P.2. Available: http://119.82.96.198:8080/jspui/bitstream/123456789/237/1/KOHA%20and%20Newgenlib.pdf. (September 10, 2013)

Tennant, R. (2007). Dawn of a new era. *Library Journal*, 132(3), 27

Ukachi, Ngozi. 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), pp.001-009. Available: http://interesjournals.org/IRJLIAS/Contents/2012%20content/January.htm. (January 27, 2013)