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Integrated Library System Implementation: The Bowen University Library Experience with Koha Software

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Abstract

The purpose of the paper is to share the Bowen University Library experiences running and administering Koha Integrated Library System (ILS) for about nine years. The paper describes the application of the software by the staff of Bowen University Library. The authors perused the library annual reports and the quarterly reports of activities as kept by sections and units. Clarification was also sought from the librarians, who daily run and maintain Koha software to gain an understanding of challenges they face and how these challenges were resolved. The users noted that Koha ILS helped tremendously with the library technical processes and services, and that the challenges encountered and their successful resolutions had also helped in the effective delivery of the library and information services and the development of staff IT skills. The authors noted from practical perspective that these experiences were useful for people who were evaluating open source ILSs, those already running ILSs, as well as those who were in the process of adoption. Unfortunately, to the knowledge of the authors, there has not been much of any existing literature on practical experiences of running and maintaining an open source integrated library system such as the Koha. The paper therefore could thus contribute to knowledge in this domain of ILS.

Introduction

Wikipedia, the free encyclopedia (2016), describes the integrated library system (ILS) as an enterprise resource planning system for a library, and it is used to track items owned, orders made, bills paid and patrons who have borrowed items. It is also known as library management system (LMS). It is made up of modules integrated with a unified interface e.g. acquisitions (ordering, receiving and invoicing materials), cataloguing (classifying and indexing materials), circulation (lending materials to patrons and receiving them back), serials (tracking magazines, journals and newspaper holdings) and the Online Public Access Catalogue (OPAC, public interface for users).

This system has made library materials' processing a lot easier compared to the old system of manually and independently processing of the same. In the old system, librarians ordered materials with ordering slips, catalogued materials manually and indexed them with the card catalogue system (in which all bibliographic data was kept on a single index card), collected fines using a designated staff, and users signed out books manually, with the book slip kept in the book pocket bearing the borrower's name kept at the circulation desk. Locating and retrieving items in this old system required that the patron knew either the call number or the book subjects indexed without which the user will be unable to locate and retrieve the needed material.

Library automation is growing at a fast rate as a result of the growth of the ILS market. The growth in the 1990s was attributed to the decline in the cost of hardware and software, addition of missing modules in the automation software (e.g. acquisitions and serials), and the creation of software that is machine independent i.e. can operate on a much wider variety of hardware (Gilliam, 1990). Further developments have again seen the ILS vendors

increasing the number of services offered, thus encouraging smaller libraries and smaller library systems to get into automation. Therefore, with the rapid, efficient computer services, particularly the Internet, and with the development in ILS, users no longer have to worry about call numbers and the subjects as ILS now allows users to more actively engage with their libraries through the web-based Online Public Access Catalogues (OPACs). Users could log into their library accounts to reserve or renew books, as well as authenticate themselves to library-subscribed online databases. Unfortunately, with the improvements come increases in ILS prices, leading to some dissatisfaction among many small libraries. This situation encouraged the development of open source software ILS.

Open Source Software ILS for Libraries

The literature is replete with the attributes of the open source software and reasons for the suitability of its use in libraries. According to Kumar and Jasimudeen (2012), open source software (OSS) makes possible the ability to run, copy, distribute, study, change, share and improve for any purpose, and thus enables libraries to have greater control over their working environment. In other words, they enable libraries have ownership of the computing environment (Morgan, n.d.). In addition, it allows for community participation, greater opportunities for innovation (Morgan, n.d.) and provides the capability to integrate or consolidate server, service, application, and workstation management for powerful administration (Randhawa, n.d.). Available support for open source is also said to be superior to proprietary solutions, the reason many technology companies are now supporting open source with free online and multiple levels of paid support (Randhawa, n.d.)

Other attributes/potentials of OSS include cost effectiveness, interoperability (open standard), user friendliness, reliability (devoid of 'bug'), stability, auditability (since source code is published), and flexibility/customisation (i.e. the possibility of software modification to suit a specific function desired by the user) (Muffatto, 2006; Tennant, 2007; Clark, 2008; Gonzale-Barahona, 2000 cited in Ukachi, Nwachukwu, and Onuoha, 2014; Chudnov, 1999 cited in Kumar and Jasimudeen, 2012; and Hall, Ames and Brice, 2013). According to Hall, Ames and Brice (2013), the OSS potentials of reliability, the gain over the control of hardware purchases, and the customisation informed the Crawford County Federated Library Systems continued use of OSS. Randhawa (n.d.) noted that among the factors pushing libraries into adopting open source software are the opportunity provided for libraries to cut down budget on software, escape vendor lock-in, simplified licence management, scaling/consolidation potential, lower hardware cost, support, unified management, quality and opportunity for shared responsibility.

These are probably the reasons why the open source software is considered suitable for libraries and probably the reason Koha became the choice of the Royal London Homoeopathic Hospital (Gerhard, 2008). According to Gerhard, the GNU licence (open source) was considered more future proof than proprietary products, and more open to customisation to meet the special needs of the library.

Quite a number of OSS are said to be available today for library automation. These include Koha, Evergreen, ABCD, WinISIS, NewGenLib, Emilda, PMB (PhpMyBibli), and WEBLIS (Ukachi, Okechuku and Onuoha, 2014) among others. However, Müller's (2011) evaluation of 20 free open source ILS platforms offered to the library community, using such criteria as: their qualification as truly open source or freely-licenced software, evaluation of the community behind each open source or free ILS project, and the ILSs most suited to the needs of libraries identified three Open Source Software – Evergreen, Koha, and PMB, as having satisfied the criteria and so presented options from which librarians and decision makers can choose without worrying about how sustainable each open or free project is, as well as understanding which ILS provides them with the functionalities to meet the needs of their institutions.

However, among the many web based open source software in integrated library system, Koha ILS is one of two that have been found to support cloud computing, the other being NewGenLib (Kumar and Mandal, 2013). Cloud computing is completely new in technology, and is considered the 3rd revolution after Personal Computer (PC) and the Internet. Cloud computing according to Reddy (2012) is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly

provisioned and released with minimal management effort or service provider interaction. The cloud users do not manage the cloud infrastructure and platform on which the application is running. This, according to Hamdapa (2012) cited in Kumar and Mandal (2013) eliminates the need to install and run the application on the cloud user's own computers, thus simplifying maintenance and support.

Koha Integrated Library System

Koha is, however, the first open-source fully featured integrated library system in use worldwide. It originated in 1999 (Strathmore Research and Consultancy Center, n.d.; Breeding, 2002). The full-featured Koha, developed initially in New Zealand but currently maintained by a team of software providers and library technology staff from around the world, has the following key features: Web based, copy cataloguing and Z39.50, MARC 21 and UNIMARC for professional cataloguers, manage online and offline resources with the same tool, RSS feed of new acquisitions, email and/or text 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 acquisitions options, multitasking and enables updates of circulation and cataloguing and issues to occur simultaneously (Sheeja, 2009)

Koha, according to Kumar and Mandal (2013), supports cloud computing for identification, collection, organisation and dissemination of digital resources for the users, as well as library professionals. In other words, all modules in Koha and services can be accessed when placed on the cloud. Kumar and Mandal's twelve checklists (of new innovative features in library automation) found available in Koha software and working on the cloud include single point entry for all library information, state-of-the-art web interface, enriched content, faceted navigation, simple keyword search box on every page, relevancy, user contribution, RSS feeds, integration with social network sites and Persistent links.

Placing Koha on the cloud provides such advantages of cost saving, flexibility and innovation, user centric, openness, transparency, interoperability, representation, availability anytime anywhere, connecting and conversing, and creating and collaborating (Gasavi, Shinde, and Dhakulkar, 2012). On the surface, it is believed according to Gosavi, Shinde and Dhakulkar, that the library would have some control over data and collection placed on the cloud.

Related Literature

Open source software integrated library systems (OSS ILS) have become a popular alternative to traditional, proprietary systems among library professionals. They are rapidly gaining attention of LIS professional community as they are found to have received positive perceptions from library professionals (Rafiq, 2009 cited in Sheeja, 2009). This is because they provide alternative, cheap and innovative technological solution for libraries. Bretthauer (2002) cited in Sheeja (2009) considered open source software an opportunity for libraries and with a "tendency to push innovations". In the study conducted by Keast, Koha ILS is seen as an example of open source technology which can be readily and successfully implemented, even in an environment where information technology is basic and funds are limited. Koha ILS has, as a result, expanded from serving as the integrated library system (ILS) at a single public library in New Zealand to more than 1000 academic, public, and private libraries across the globe (Willis, 2010).

Keast (2011), Kumar and Jasimudeen (2012) and Omezulor et al (2012) report some challenges with the implementation of Koha ILS. The study by Keast reports the challenges of poor Internet access, and slow speed and low bandwidth in the accessibility of Greater Western Area Health Service (GWAHS) library service in rural areas. Kumar and Jasimudeen (2012) in their study undertaken to explore the perceptions of the emerging library community that has taken to Koha in India revealed that difficulties were experienced in installation and maintenance (because of its complex installation procedure), data migration and network problems, although the nature of such difficulties and how they were resolved were not stated. Omezulor et al (2012) in their study revealed that erratic power supply and insufficient manpower were the bane for the smooth running of the software. These challenges have slowed the adoption of OSS ILS in a number of libraries.

Interestingly, other than the reasons of adoption, and the implementation/adoption challenges that have been reported in the literature, there has not been any literature to the knowledge of these authors that have reported on the practical experiences of the day-to-day running and maintenance of Koha ILS. Researchers and potential adopters/users would no doubt be interested in the actual experiences of the daily usage with regards to the challenges encountered and how they were resolved.

The experiences of librarians according to Singh (2013b) are useful for people who are evaluating open source ILSs, as well as those who are in the process of adoption. Learning from their experiences will help librarians not to reinvent the wheel. The experiences shared in this paper will therefore help the librarians by empowering them with the information they need; and also in understanding the current status of Koha ILS software.

Installation of Koha ILS at Bowen University Library

Bowen University Library, Iwo in Osun State is the first university library in Nigeria to install and fully utilise Koha ILS. It is currently the longest running Koha installation in the country. The Library commenced automation of the library functions in September 2007 using Koha ILS version 2.9. The commercial Koha service company that helped with the installation was ProjektLink, Nigeria Limited, Ibadan. The installation and the testing of the software as well as training of staff were completed in October 2007 but went live in November 2007. The Library upgraded to 3.0.01 version in 2008, 3.0.04 in 2011, version 3.12.03 in 2013, and to versions 3.18.00 and 3.22.00 both in 2015. The library maintains its local area network (LAN) within the institution's network, with a public Internet Protocol (IP) address. This is to ensure that any disturbance of the institution's network will not affect accessibility to Koha.

Bowen University Library's attraction to adopting Koha, like other libraries, was informed by its open source, i.e. free with no vendor lock-in, no hidden code, and no licence fees nor any other cost other than the cost of installation and customisation, as well as the opportunity of participation in its development through the community of users' forum. Other considerations were: the ready availability of a reputable commercial Koha service company capable of installing, customising the software, and providing training support (in this case ProjektLink Ibadan, Nigeria), its MARC compliance, its compatibility with all hardware types (i.e. IBM, Apple, HP, Dell, etc), its user friendliness, regular revision to take care of suggestions, and the fact that it is web-based providing opportunities to login from remote locations. These considerations are considered germane to any successful automation project.

Indeed, library users' survey results of satisfaction in its first three years of use reported Koha as performing to expectations. The respondents also rated as good and very good. Koha's reliability (100%), Acquisitions module (53%), Cataloguing and Circulations module (73.3%), OPAC (73.3%), Patrons' authentication (93.3), Report creation (66.6%), and Interface with Internet (100%) (Otunla and Akanmu-Adeyemo, 2010). The study report further strengthened library management support for the success and sustainability of the automation project.

With over eight years of consistently running Koha ILS, the purpose of this paper therefore is to share Bowen University Library's experiences with implementing and consistently running Koha Open Source Integrated Library System.

Objectives of the paper

Specific objectives are to:

- Document the experiences with Koha implementation
- Document the experiences with the use of Koha modules
- Document the challenges with the daily usage of Koha and how those challenges were resolved
- Document the challenges with Koha systems maintenance and how those challenges were resolved
- Attempt to convince libraries of the suitability of open source software (OSS) integrated library systems for library automation projects.

This study is based mainly on the experience of using Koha ILS in the processing of library materials and administering it respectively in the last seven years. The authors perused reports of activities kept (i.e. the quarterly reports from sections and units of the library, and the library annual reports), with clarification from those using the software, on challenges and their resolutions. Quarterly reports, as the name implies, are produced every quarter to report activities for discussion at quarterly meetings. The annual reports are produced from the quarterly reports and other library documents. The annual report summarises all library and information delivery services and activities for the year.

The findings are reported as follows:

Bowen University Library's Experiences with Koha ILS

Bowen University Library had no prior experience in automation projects. In other words, it was automating for the very first time, and therefore, as a department, had no experience to fall back on. However, it benefitted from the experiences of the head of the Library who had had substantial experience in automation projects. Notwithstanding, every automation project comes with its peculiar challenges and so experiences differ.

Experiences with implementing Koha software modules

Securing competent staff

Every automation project needs an expert with a background in computer science and knowledge of programming languages to take charge of administration and the maintenance of the automated system. Bowen University recognised the need for this expertise and was thus faced with the challenge of getting such technical personnel. This was because at the time of Koha ILS adoption the three librarians in employment were graduates who had just a little above three years of librarianship experience without a background in computer science and/or knowledge of programming. The option before the library management was therefore to employ a graduate of computer science to work with the librarians so as to understand the library science llnguage as opposed to pure computer science language hoping that in future he/she could be persuaded to obtain a master's degree in library science. Unfortunately, it was difficult at the time (and still is) to find library science graduates with computer science background or find graduates of computer science willing to work in the library, as many of them do not consider library work as challenging enough. The Library had to solicit the assistance of its commercial Koha service company. This yielded a good result about a month after completion of installation; and since then, the library had no challenge bordering on technical handling of the administration and maintenance of the system.

Power supply

The usual complaint is always erratic power supply. Bowen University Library had no challenge with power supply, with regular supply coming from university's power generating sets. The University Management considers the library a priority when it comes to power supply distribution. The Library, which has moved to its permanent building now, has its own power generating set.

Bandwidth

Koha is web-based and therefore enables provision of public services including providing access to the collection held by Bowen Library and other libraries, as well as e-resources available on the World Wide Web (WWW). However, this is only possible with the provision of adequate bandwidth which was (and still is) a major issue in many automation projects. The challenge therefore was making sure there was adequate bandwidth for optimal service delivery. Recognising this challenge, the library had to impress on the University Management the need to provide adequate bandwidth for uninterrupted service provision. Although the University Management acceded to the request, with the expansion of the university, there are still challenges with the bandwidth which the university continues to address. It is however not as pronounced as it was at the early period of automation.

IP addresses

Along with the issue of bandwidth was the poor service being provided by the university Internet Service Providers (ISP). There was always a

constant change of IP addresses already submitted to the database vendors without prior notification. The consequence was that the databases to which the library had subscribed became inaccessible until they were discovered, and the new IP addresses supplied by the ISP were sent to the database vendors. At some point, sending apologies to the database vendors for constantly changing IP addresses became embarrassing. So, working with the Directorate of Information and Communication Technology (DICT), the university succeeded in purchasing blocks of IP addresses from AFRINIC, South Africa from which a block of IP addresses was allocated to the library. This was given to the database vendors, thus the library was insulated from the erratic service provided by the ISP such that even when the ISP changes, it no longer affects e-resource service provision.

Experiences with working with Koha modules

The library has so far had positive experiences of Koha through the functionalities of the modules. The experiences are detailed below:

Acquisitions

Although most libraries prefer to manage the acquisitions process manually rather than using the Koha acquisitions module, it has been in use by the library since 2007 to acquire library materials, especially through purchases, as well as to track budgets/funds and all materials added to the library database. Koha acquisitions module has been used to create vendors and budgets, track budget/fund, manage purchase suggestions, perform acquisitions searches, place orders, receive ordered items, track late or missing orders, create invoices for ordered items, and claim late orders.

Librarians note that the module has great flexibility and is user friendly as it makes selection of item type e.g. books, audio cassettes, CD, DVD, etc., possible while the template displays the fields as appropriate for the chosen type; enables the librarian to set up a budget; and create suppliers/ vendors and record orders, which are linked to specific suppliers and budgets. As orders are placed, the amount is subtracted from linked budgets. The module also makes it possible to perform both "simple" and "full" acquisitions as desired. *Simple* acquisitions, particularly makes it possible to acquire items and add directly to the library catalogue without managing orders placed with the suppliers and budgetary matters. However, with *Full* acquisitions, there is need to manage budgets, book funds and orders.

The module makes accounting (i.e. tracking of budgets and funds), very easy. Librarians are also able to perform searches within the library database to confirm the availability of a particular title in the library before ordering. This prevents duplication when purchasing items, and as such, helps the library save money.

Cataloguing

Koha's simple and advanced search helps tremendously in culling out existing records from acquisitions for editing. Koha makes use of MARC 21 and UNIMARC standard for cataloguing framework. With this framework, the cataloguers, working with the acquisitions staff, are able to create new records that do not exist in the database while the use of Z39.50 standard for downloading the cataloguing details from remote library server (e.g. Library of Congress) makes editing of records already created faster. Not only is the module simple, it is also flexible and user friendly. Koha helps maintenance of database integrity as it allows the cleaning of the database, thus removing the problem of incomplete record and duplicated barcode (accession number). Koha allows batch saving of items, deletion of duplicate records from the database, and time saving in material processing. It permits easy retrieval of items from the database through the use of access points such as barcode, ISBN, title, subject and author.

Circulation control

Unlike the traditional manual user registration, Koha ILS eases patron registration through the possibility of online self-registration. It also allows patrons to edit/modify account, create private/public reading list(s), tag, secure transaction through self-activated passwords, monitor fine imposition, place items of interest on hold, do self-renewal of items, and suggest useful titles for acquisition at the comfort of the patrons' office/hostel. Koha also allows generation

of overdue fines/notices, issuance of notices to defaulting patrons, restriction of patron's account to enforce compliance with library rules, easy de-activation of patrons' account as a result of graduation/disengagement from service, and setting of limit on overdue fine. The experience also shows that Koha is not susceptible to manipulation, as overdue fines are system generated and cannot be deleted without due permission.

Serials control

The Serials module of Koha has made tracking of journals and other materials that come in on a regular schedule, as well as monitoring branch of the library holding specific journal title much easier for the library. Through its use, receipt of multiple issues and editing of same at once has also been made possible. Koha serials module makes it possible to spot late issues at a glance from the subscription page, and make claims by sending a list of the missing issues via e-mail to the vendors selecting from the list of vendors.

Reports generation

Koha makes report generation less cumbersome. Koha has its own guided report and can also accommodate generation of reports using Structured Query Language (SQL) statements, which makes it compliant with modern day software. The library has therefore taken advantage of this facility to customise reports. This had allowed the library to generate management reports in shorter time than was possible using the manual process. For example, it has become easier for the library to generate list of holdings for the various departments of the university on demand, and for the National Universities Commission (NUC) teams during accreditation visitations, as well as produce other statistical reports whenever required.

Challenges in Running and Maintaining Koha ILS

Since the adoption of Koha, there has not been any major complaints about its versatility. However, there had been some hardware and software challenges, the latter of which can also be experienced on cloud (e.g. duplication of barcode, wrong mapping, indexing problem, Koha's inability to send mail, double-charging of overdue fines and patron ID stamp not on overdue fines payment). These challenges are as discussed below:

Crashing of the operating system and the database

The library had experienced the following situations in the past: Koha inaccessibility, Koha displaying a message such as 'the server is down' or 'temporarily unavailable contact the administrator', and Koha stops functioning. It was discovered that these occur due to power surge/fluctuation, which led to the operating system or the database crashing. The latter occurred because the fault tolerance of MySQL used by version 2.9 was very low. It was also discovered that a normal uninterrupted power supply (UPS) could not trap sensitive power fluctuation and the library had to purchase an on-line UPS and an inverter to address the occurrences (Bowen University Library, 2015).

Wrong date on Koha

The library had also experienced situations where all modules were displaying wrong dates, which affected normal library services such as charging out of books, returning of books, and calculation of fines, acquisitions, cataloguing and reports generation. It was discovered that this was a result of low CMOS battery on the motherboard of the Koha server. The library had to change the CMOS battery and adjust the date on the operating system of the Koha server.

Non-booting of Koha server

The library sometime in 2009 experienced a situation when services could not be delivered to patrons. It was discovered that the motherboard of the server had been damaged as a result of thunderbolts passing through the network cable. The thunderbolts had before then occurred twice. This damage to the motherboard resulted in non-booting of the server. The library had to change the mother board to restore normal service, and in addition prevailed on the University Management to install a thunder arrestor in the building (Bowen University Library, 2009).

Koha server rebooting

In 2013, the library also experienced rebooting of the Koha server. While working Koha suddenly went off and rebooted. It was found to be a result of power fluctuation or outage, an indication that the inverter was not backing up. The library had to change the inverter batteries to batteries of higher capacity to resolve this occurrence (Bowen University Library, 2013).

Non-connection of client workstation to the server

In 2014, the library experienced situations in which the clients' workstations refused to connect to the server. It was discovered to be a result of faulty network switches. The switches had to be replaced with better network switches. It was also discovered, at some point, that the Law Library which is quite a distance from the main library could not connect to the server because the named server (DNS) on campus was down. This was resolved by using IP address instead of the domain name to access the server (Bowen University Library, 2014).

Mounting as read-only

There was, in 2015, a situation when Koha was found to be reverting to previous entries. It was discovered to be a result of the operating system (Linux) mounting the hard disk as a read-only file. Although Koha will function normally when this happens but once the server is shut down, all processes will be reversed. What, however, saved the situation was that the systems unit had cultivated the habit of backing up the database regularly, sometime thrice a day, and so the library was able to format and restore the whole server including the current database (Bowen University Library, 2015).

Koha allowing duplication of barcode

The library also experienced situations where Koha was found to be allowing duplication of barcode in the earlier versions of Koha (i.e., 2.9 and 3.0.1). This was discovered to be a result of a bug within the Koha software, which incidentally has been resolved by the higher version of Koha. But at the time this was discovered, the library had to restrict the allocation of barcodes to acquisitions module only. This was possible because the library uses all modules in Koha, which implies that every item must pass through acquisitions (Bowen University Library, 2008).

Wrong mapping

Sometime in 2014, it was discovered that dates items that were accessioned were being presented as 'date last seen'. It was discovered that entries in Koha had been wrongly mapped into different fields in the database of the earlier version of Koha, and so when searching the catalogue a wrong impression was given such that 'date last seen' (i.e. date the item was checked out or returned) was seen as 'date accessioned'. The library resolved the challenge by re-mapping in the 'Koha to MARC mapping' under 'Koha administration' (Bowen University Library, 2014).

Indexing problem on Koha

There had been situations when Koha was returning wrong results whenever searches were conducted. This was discovered to be a result of zebra's partial indexing of the database, and the number of partial indexing carried out per day. It was resolved by formatting the server, restoring the database from the system backup, updating the database with current backup and running full zebra indexing (Bowen University Library, 2011, 2013).

Uninterrupted sleep by Koha

In 2011, the library experienced situations in which Koha was not allowing input or searches. It was discovered that Koha had triggered itself into a 'sleeping mode'. The server had to be rebooted by the Systems Administrator to solve the problem. The freezing mode was discovered to occur whenever Koha initiated some processes leading to "uninterrupted sleep" as shown by the systems log at the back end (at the backend in the log of the server, it would report Koha apache process number 'sleeping'). It was, however, resolved after upgrading Koha from the version 3.0.01 in use then to 3.0.04 (Bowen University Library, 2012).

Koha stopped sending mails to patrons

The library noticed, in 2014, that for some time, mails were not being sent to patrons. It was discovered that Google which was the mail agent used for sending mails had blocked the accounts as most of the mails sent were bouncing back. The Systems Administrator resolved the problem by creating another Google account and blocked all patron email accounts that were inactive by spamming the email addresses (Bowen University Library, 2014).

Koha stopped charging overdue fines

There was a time when Koha stopped charging overdue fines. It was discovered that this happened because the record of an item on loan was wrongly deleted. To resolve this problem, the database had to be reversed two weeks in order to stabilise the database, charge-in the loaned item and properly delete the record (Bowen University Library, 2011).

Koha not calculating overdue fines

There was also a time it was discovered that Koha was not calculating fines. Trouble-shooting revealed that this occurred because the 'cron job' (the scheduler) scheduled to calculate fines at 12:00am daily failed to do so as a result of shutting down the server earlier at about 9:00 pm daily, thereby preventing the system from running the 'cron job'. In order to prevent further occurrence of this, the library had to stop shutting down the server, which however had to be backed up by an inverter (Bowen University Library, 2011).

Koha double-charging overdue fines

Sometime in 2012, the library noticed double charging of the fines in patron's accounts. The library noted that this happened whenever patrons self-renewed items in an 'expired account'. The situation was very challenging; the library had to disable self-renewal to prevent double charging while trying to address the problem. Fortunately, upgrading of Koha from version 3.0.01 to 3.0.04 helped resolve the problem (Bowen University Library, 2012).

Patron identification stamp not on overdue fines payment

The library also experienced in 2012, a situation where the receiver of overdue fines paid by patrons could not be identified. This situation was experienced with versions 2.9, 3.0.01 and 3.0.04, but was resolved using 'permission' in the patrons' registration. However, version 3.12.03 has taken care of the challenge, as it now puts patrons' ID of both the borrower and the library staff that paid in the overdue fines, and date stamp on overdue fines payments record (Bowen University Library, 2012).

Inability of Koha to monitor patron transaction

Until recently, the library had experienced with the earlier Koha versions (i.e. versions 2.9, 3.0.1, and 3.0.04) situations where it was impossible to identify who processed an item, modified the item and what was modified. However, the setting up of the 'Log Viewer' in the 3.12.03 upgrade version of Koha corrected the observed lapses with searching guided by date. The setup required increased RAM size and processor speed (Bowen University Library, 2012).

Available items showing as 'not loanable'

The library has also had situations when some items in OPAC were showing status 'not available'. The reason was discovered to be because cataloguers were selecting 'not available' for item types that had been set as 'not loanable' from the system's back end, thereby nullifying the item's availability on OPAC. In order for this to be resolved, the Systems Administrator had to advise the cataloguers to always select 'available' for all items so that only 'item type' property from the system's back end would define the availability of items on the OPAC, and it worked (Bowen University Library, 2013b).

System error

The users sometimes see a 'system error' message. This was observed to appear whenever there was power surge or outage during work in progress. Attempt to open the work from where it stopped on the client PC then gives a 'system error' message. During this time Koha would be unable to run on the PC. This was usually resolved by leaving the system for some time in order for all the network switches to re-connect the network. This was the situation until the library introduced the on-line UPSs, which completely stopped the network switches from going down.

Gains from the Resolution of Challenges

In spite of the challenges experienced in running and maintaining Koha ILS, there have been gains as better service delivery and development of skilled manpower. The successful implementation of Koha ILS had resulted in the library becoming a reference point in Nigeria for other libraries intending to implement Koha or unable to make headway in the day-to-day running and maintenance of the software. The library has mastered Koha ILS usage and continues to master its use through interaction with members of the Koha Community forum. The library has, a number of times, received librarians from other university libraries in Nigeria coming to observe how Koha is being put to use and how challenges are resolved, and wishing to learn other things about the software. The experiences gained informed the successful organisation of the March 2015 training workshop, which attracted seventeen participants from more than nine tertiary institution libraries spread across the country–Elizade University, Ilara-Mokin, Ondo State; University of Ilorin, Ilorin, Kwara State; Federal University, Oye-Ekiti, Ekiti State; American University of Nigeria (A.U.N), Yola, Adamawa State; FCT College of Education, Zuba, Abuja; Ibrahim Badamosi Babangida University, Lapai, Niger State; Nigerian Institute of Journalism, Ogba, Lagos, Lagos State; Nigerian Institute of Social and Economic Research (NISER), Oojo, Ibadan, Oyo State; and Federal Polytechnic, Offa, Kwara State.

Conclusion and Recommendations

Of benefit to libraries is the coming of open source software ILSs, which has brought down the cost of automation, prevented vendor-lock in and payment of licence fee, and allowed participation in software development through membership of the user community forum. The availability of open source software ILS should therefore be an encouragement to libraries, which have always suffered from inadequate funding, to key into the automation project.

Running Koha ILS in Bowen University Library has made library technical processes and introduction of newer information services a lot easier than was initially possible. In other words, open source software integrated library systems are making technical processes easier and the introduction of newer services such as Online Public Access Catalogue (OPAC), self-renewal of library items, information sharing through social media, item reservation, putting items on hold and many more, possible. They are providing the easy option for managing newer information services.

There is, however, no doubt that there will be challenges of implementation and of consistently running the ILS, but because of the support available through participation in the open source software ILS user community forum, such challenges can be readily surmounted. The challenges and their successful resolutions such as detailed in this case study could help in the effective use of Koha ILS and delivery of information services, while also helping to increase the library visibility.

The Bowen University Library experience with Koha open source software ILS thus lent credence to the fact that open source ILS is promising to be the system of choice, over and above the proprietary solutions, for automation projects. They will continue to play a major role in the provision of effective library and information services delivery to library customers. The paper therefore encourages adoption of open source software integrated library systems in libraries.

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