

AUTOMATION SOFTWARE AND ITS UTILIZATION: THE CASE OF LIBRARIES IN NIGERIA

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Abstract

This paper discussed the adoption and use of Integrated Library Software (ILS) in libraries across Nigeria. It focused on the concept and benefits of automation. It also highlighted some approaches for adoption and implementation of integrated library software (ILS) in libraries. This paper further discussed some ILS adoption procedures in academic libraries across Nigeria while expatiating on KOHA ILS as viable solution to libraries for effective service delivery to its users. This paper explicitly discussed a step-by-step strategy used to import a total of 23, 274 records from X-Lib automation software to KOHA ILS at Laz Otti Memorial Library, Babcock University and concludes by encouraging libraries to adopt viable automation software such as KOHA in order to forestall problems associated with system failure, poor service provision to the clientele and none visibility of the library and its materials to the users.

Keyword: Automation software, University Libraries, Nigeria

INTRODUCTION

“Library and information science occupies a vantage position in the education sector and plays a strategic role in national growth and development” (Shekarau, 2014, p. iii). Prior to the use of information and communication technology (ICT) tools in the library to access and disseminate information, traditional methods were predominantly used. Ayiah and Kumah (2011) asserted that traditional library processes proved unsatisfactory to respond quickly enough in a technology driven environment. With the growing number of collections in libraries for various courses offered in a university and the decentralization of library activities for effective service delivery to library users, Omeluzor, Adara, Madukoma, Bamidele and Umahi (2012) averred that it became inevitable to use automation software that will provide on-the-spot access to information, take accurate records or stock of library collections, identify materials on loan, link with other libraries and provide adequate library services to the users.

Library automation is the use of computer and other associated technologies to manage the library operations. It is an improved method to render services and to provide access to the library collections. Library automation creates opportunities for library users to access the library’s collections without necessarily being physically present in the library.

Library automation is a promising trend in library management and delivery of quality library services to the library users. Considering far reaching conspicuous benefits that automation software offers, they are now been deployed by libraries in the bid to join the global information society on the Internet to deliver services to a wider populace of library users in diverse regions irrespective of geo-political location, space and time.

According to the Oxford Advanced Learner’s Dictionary (8th ed.), automation is “the use of machines to do work that was previously done by people.” America Library Association (ALA) cited in Mbakwe and Ibegbulam (2014) defines automation as “operation, a series of operation or a process by self activation, self controlling, or automatic means with the aid of automatic data processing equipment such as a computer or other labour saving devices.”

As the library automate using the Internet and ICT tools, its visibility to the general public is guaranteed especially as the library is faced with competition from traditional and online bookstores. Moreso, the revolution in information service provision that is taking place in academic libraries made it imperative for academic libraries to adopt new systems, methods and services that meet user’s needs better than other providers (Yusuf, n. d.).

The library users of the 21st century usually visit the library with preconceived needs and consider the library as the last recourse to meet those needs. It should be noted that as a result of the growing competition that the library face with other information providers, it can not hesitate to adopt automation software that would enhance effective service delivery to the library users.

This paper therefore investigates adoption of automation software in academic libraries in the South South geo-political zone of Nigeria. It also highlights the benefit of automating library services and analyse the experiences, challenges as well as successful automation process in some libraries in Nigeria which would serve as a model for adopting automation software for an improved library service delivery to the library clientele.

RATIONALE FOR THIS PAPER

Academic libraries all over the world are established to support its parent institution. In this 21st century, libraries are adopting new methods to deliver services to their clientele through the use of ICT tools and ILS, thereby enhancing learning, teaching and research of its parent institution. A study by Aguolu, Harunan and Aguolu in 2006 cited in Sharma (2009) revealed that most academic and research libraries in Nigeria have not computerized any of their functions. It is now a decade since Aguolu, *et al*, made that claim; therefore, it is pertinent to study the extent to which ILS is adopted and used in academic libraries in Nigeria.

REVIEW OF LITERATURE

Benefit of automation software in library services

Automation of the library processes and services has several benefits both to parent institution and the library patrons. It ensures an effective and efficient management of the library and enhances easy access to the library collections. Molholt (1997) cited in Abbas (2014) portrayed the benefit of automation in this manner:

We no longer type cards, the system supplies them, patron do not need to copy down call numbers before going to the shelves, the online catalogues system prints them out. Patron don't sign for books, a light pen reads, their identification card and the system charges the book out to them.

Automation of library services paves the way to an enhanced service delivery to the users. It gives the librarian and library staff control of the library and its resources. Some of the benefits of library automation are

1. Effective management of library processes and services
2. Provision of services and access to library materials for the library users
3. Enhances quick retrieval of materials
4. Promotion of the library and University's ranking
5. Support to distant students and community users.

Accordingly, Okiy (1998) affirmed that the application of computer technology to university libraries has transformed the pattern of information handling, provision of services and the perception in library cooperation worldwide. Abbas (2014) asserted that university libraries are committed to the provision of up-to-date materials for the support of teaching, learning and research in their universities. Considering this invaluable role of the university library, it is pertinent using automation software that is Internet compliant cannot be overemphasized. By so doing, the tremendous amount of information that can be acquired from the "electronic libraries" of the world will be actualized.

Integrated Library software products

Library automation software comes in two forms. They are proprietary and open source software. Some of the major proprietary ILS products according to Breeding (2012) that are currently available include Symphony from SirsiDynix, Millennium from Innovative Interfaces, Aleph from Ex Libris Group, Voyager from Ex Libris Group, Polaris from Polaris Library Systems, Library Solution from The Library Corporation, Carl.X from The Library Corporation, Spydus from Civica, and many others. Uzomba, Oyebola and Izuchukwu (2015) opined that the proprietary products have been available for many years, have reached a high level of maturity, and remain the dominant approach used for library automation.

On the other hand, "open source software is free software developed for the enhancement of library routine activities. It is for anyone to have; more importantly, not only is the software free,

but it is also free for anyone to copy, hack, modify, etc. it is free to use, free to modify, and free to share. Open source mentality revolves around sharing and collaboration". (Uzomba, *et al*, (2015). Similarly, Akpokodje and Akpokodje (2015) confirmed in their survey of KOHA ILS for online library registration at the University of Jos that "open source ILSs are more cost effective than proprietary ILSs". In addition, Breeding (2012) stated that "open source software movement is one of the major alternatives for professionals who work with computer software". It involves a specific set of software license terms that specify who gets access to the source code that underlies programs, who can change them, what can or must be done with changed versions of the software, and other issues related to modifying the program. Furthermore, open source software also stands for a broader philosophical approach to software that aims to give its users more freedom and allow them to break free from constraints associated with the traditional proprietary model.

The sole aim of adopting automation software in library is to enhance access and retrieval of materials; and to increase the library's performance in supporting its users. Over the last decade, a considerable number of ILS have been developed to ease information management and access. In choosing ILS, Osaniyi (2010) and Omeluzor, *et al* (2012) suggested that there is need for libraries to determine the strength, capability of any automation software and cost before adoption and use. This is because some library automation software adopted and used in some academic libraries in Nigeria have failed (Osaniyi, 2010; Adeyemi, 2002; Ibrahim, 2012; Omeluzor, *et al*, 2012; Mbakwe and Ibegbula, 2014 and Uzomba, *et al*, 2015).

Osaniyi (2010) and Hassan (2011) in their separate study argued that vendors' attitude to support their clients has been discouraging and unacceptable. Osaniyi (2010) lamented that a major problem that libraries in Nigeria have with international vendors is largely due to factors related to cost and support. He noted that technical support for the integrated library systems was either not available or unreliable. Furthermore, commercial vendors do not have consideration to offer their software at nominal cost/free of cost while some software have inherent problems and susceptible to virus attack (Omeluzor, *et al*, 2012).

Approaches to integrated library software adoption, implementation and conversion

Library information software are dynamic and evolve with new technologies and developments in ICT. Automation of library processes and services using ILS cannot be done without recourse to the developments in ICT. This situation left the libraries with no option than to join the advancement. In order to avert problem of software failure, it would be necessary to adopt software that enhances library services and stand the test of time. Librarians should understand processes that are involved in adoption, implementation and conversion of library software. Adoption is the acceptance and installation of software that has been expected to achieve certain goals and objectives in the library. On the other hand, implementation is the utilization of the modules and features which a software offers while conversion is sorting and pulling resources from one information system to another. Libraries sometimes adopt and implement an information system using either parallel, direct, phase or pilot approach. This scenario which is mostly used in system conversion is also applicable to ILS utilization. A systems librarian would advise on the possible approach to follow. There are four approaches to convert an existing information system.

1. Parallel approach

This approach allows the use of both old and new systems together; running concurrently while attention is paid to the new system. It is to ensure that the new system is in good shape to handle task before stopping the old system. This may come to play when a library is already using a

software and has also started using a new one without discontinuing the old one. While preparing to discontinue the old one for the new software, a notice would be placed on the user interface of the old one alerting the users about the situation.

2. *Direct approach*

This approach requires complete shutdown of the old system before the new one is put into use. Usually, this approach takes a breakdown of operation for at least a day. The old system is discontinued today, and the new one is used the next day. Before the action is taken, systems librarian or analyst would notify the users of system maintenance or a possible limited service within the period of the conversion.

3. *Phased approach*

The phase approach is the implementation of system in phases. Firstly, the system is divided into phase and each phase is given a particular number, i.e. phase one, phase two, etc. Accordingly, the 'phase one' will be implemented first and allowed to run over a period of time followed by 'phase two' before other subsequent phases. This kind of approach ensures that each phase that is implemented is tested and monitored for possible errors. Phase approach eradicate general system breakdown if one phase is erroneous.

4. *Pilot approach* (single location)

A pilot approach enables the implementation of a new system in a particular location first. This approach gives opportunity to understand what challenges that the system may have before it is deployed in other locations. Every feature of the system would be checked and tested if there are areas that needs modification or to be changed. Should therefore be errors or problem, pilot approach ensures that the location that the system was implemented will only be affected, and of course, such errors would be corrected.

In Nigeria, Ahmadu Bello University (ABU), Zaria and University of Ibadan (UI) both used phased approach. These libraries at separate times adopted automation software and implemented the modules at different times. At ABU, the acquisition, cataloguing, reference, circulation and serials' modules were partially implemented while at UI, only the cataloguing module was fully implemented. The acquisition and serials module were partially implemented while the reference and circulation modules were proposed to be implemented (Abbas, 2014).

Challenges of adopting of library automation in academic libraries in Nigeria

Libraries in Nigeria are evolving and moving towards an era of prominence through adoption of library software and delivery of information services. Despite the benefits of ILS in library services, Ani (2007) stated that library automation in Nigerian universities is still at the crawling stage. This assertion is against efforts made by some university administration to reverse the trend. Abbas (2014) attributed the problem to inadequate funding of Nigerian universities. According to him, University funding has continued to dwindle since the mid-1980s along with the downturn in the economic fortunes of Nigeria.

Some libraries in Nigeria have adopted and implemented library software over the years. Ibrahim (2012) noted that "the first attempt to computerize Nigerian university libraries in the 1970s failed". The failure of this first attempt was attributed to manpower problem, funding, poor maintenance of equipments and epileptic power supply system (Ehikamenor, 1990 and Ifebuzor, 1977). Other studies (Nok, 2006; Okiy, 1999; Adegbore, 2010; Omeluzor, *et al*, 2012; Osaniyi, 2010; and Mbakwe and Ibegbulam, 2014) also found out that automating libraries in Nigeria was bedevilled with many challenges such as lack of support from vendors, poor

WAN/LAN, low computer literacy/education among staff, poor state of power generation, poor maintenance culture, lack of fund, lack of training, lack of technical knowhow and virus attack.

According to Ibrahim (2012), the International Institute for Tropical Agriculture (IITA) announced its large-scale automation success story using software called Battelle Automated Search Information System (BASIS). Similarly, Lawani, Azubuike and Ibekwe (1992) reported the automation success story with BASIS hung on a VAX 750 minicomputer. The National Universities Commission (NUC), the only university regulatory body saddled with the responsibility of managing universities in Nigeria introduced TINLIB, a foreign software into the university libraries. Uzomba, Oyebola and Izuchukwu, (2015) reported that the NUC had donated one 386 ICL computer systems and TINLIB software to some federal university libraries in 1994. Many libraries like Ladoke Akintola University of Technology (a State University), Development Policy Centre library at Ibadan also adopted this software (Idowu and Mabawonku, 1999). However, this second attempts at the university libraries using TINLIB also failed (Uzomba, *et al*, 2015).

The University of Nigeria, Enugu (UNEC) Library, one of the Federal Universities in the South East zone at several times automated with TINLIB, X-LIB and LIB+. The purpose of adopting automation software is to enhance information management, access and dissemination which encompasses delivery of quality library services to the library users. According to Mbakwe and Ibegbulam (2014), data were entered in the acquisition and cataloguing modules of TINLIB and had almost converted from manual system to automated system before all the problems associated with it became obvious.

After the failure of TINLIB, the library quickly adopted X-Lib. Its adoption was herald with much enthusiasm having being disappointed by TINLIB. Mbakwe and Ibegbulam (2014) asserted that input of data into all the modules of XLIB had gone quite far in the library before it was again abandoned because of lack of maintenance, inadequate skilled manpower, funding and virus attack which crashed the system. With the bitter experience over the two automation software, the library adopted LIB+ (LIBPLUS). LIB+ according to Uzomba, *et al*. (2015) is a transformation of XLIB. The University of Nigeria, Enugu Library unsuspecting adopted LIB+ which promised to provide all the features and modules for effective management of the library services. According to them, the features of LIB+ which is synonymous with other integrated library software (ILS) enticed the librarians to adopt the software.

Unfortunately, the system was also abandoned after input of data had gone far. One may wonder why such software that has much to offer would be abandoned. However, Mbakwe and Ibegbulam (2014) reported that the abandonment was as a result of high subscription and maintenance cost for 'a free open source software'. Among what constituted problems are inadequate funding, high subscription cost, shortage and lack of skilled manpower, erratic power supply and frequent system failure.

Studies, Adeyemi (2002), Osaniyi (2010), Omeluzor, *et al*. (2012), and Mbakwe and Ibegbula (2014) have shown that automation process in Nigeria using ILS such as X-lib, TINLIB, LIB+, CDS/ISIS had failed due to problems associated with software porosity, compatibility issue, susceptible to virus attack, vendors' poor attitude to respond and lack of skilful manpower.

Despite these challenges, academic libraries in Nigeria have not relented in pursuing their mandate through use of both proprietary and open source automation software. Although, proprietary automation software have thrived with a lot of challenges arising from inaccessible source code. Boss (2008) stated that free (open source) software provides the original source code used to create it so that users can modify to make it work better for them. Open source software also gives right of redistribution; therefore, there may be both open source and

proprietary products that are based on open source software. Conversely, a closed, proprietary system limits the ways the library can access the underlying data (Breeding, 2009).

Uzomba, *et al* (2015) stated that there are many different kinds of open source library software solutions today that could be embraced by the library. Some of the open source software in today's market includes: Emilda, EspaBiblio, Evergreen, Gnuteca, InfoCID, Jayuya, Koha, NewGenLib, oBiblio, OPALS, OpenAmapthèque, OpenBiblio, PhpMyLibrary, PMB, Senayan etc. They emphasized that of all the open source software available in the market, Koha and Evergreen have gained major extensions in functionality not present in their counterparts. Muller (2011) stated that "Koha and Evergreen are considered sustainable communities because they both have obtained a critical mass of interested developers, contributors and users."

The Bowen University Library, a privately owned university in Nigeria chooses to automate their library with Koha open source library management software. Otunla and Akanmu-Adeyemo (2010) maintained that the decision to automate the library with Koha was to enhance the operations of the library and provision of information services to the clientele. Adoption and installation of Koha at the Bowen University library has shown a successful result. A survey on library users' satisfaction with the software indicated that users preferred the automated system to manual system. The study of Otunla, *et al* (2010) encouraged libraries to consider use of open source software for their automation project and to be open to changes that ICT introduces to library profession.

A record of success and breakthrough on library automation software was the adoption of Koha at the Laz Otti Memorial (LOM) Library in Babcock University; a privately owned institution of higher learning by the Seventh-day Adventist Church. Omeluzor, *et al* (2012) reported that the library originally used card catalogue to manage the library collection and to provide access to its materials. Since library is a growing organism (Ranganatha, n.d.), the library collection began to grow especially when the University was granted charter in 1999 by the Federal Government of Nigeria as a degree awarding institution.

The University Library Management in 2003 adopted X-Lib software to provide services and access to its users. Data were inputted into the X-Lib system which enhanced access to the library resources within the library. The X-Lib was only accessible within the library computer terminals and some few computers that are connected to the Library local area network (LAN). It helped the users to search and retrieved information on materials that are in the Library, hence providing bibliographic information and their location on the shelves.

The cataloguing unit also worked tirelessly to ensure that all library collections were inputted into the software. X-Lib according to Osaniyi (2010) was developed in Nigeria by a team of computer experts working in association with the Raw Materials Research Development Council (RMRDC), being an agency of the Federal Ministry of Science and Technology. The first version of X-Lib was introduced in 1996. The millennium version which the LOM Library, Babcock University adopted was released in 2000 by BERAM Ltd. and RMRDC.

X-Lib software with its limitations could not support the demands of the 21st century library users since it is not internet compliant. The software also became susceptible to several inherent challenges, and since it was the desire of the University library to support its users beyond the library walls, a decision was taken to implement viable library software. Several options abound, which required on-the-spot assessment of their capabilities to avoid a repeat of the errors encountered with X-Lib.

Among all the options, KOHA has the required modules and features for effective management of Library routine activities. The modules are circulation, cataloguing, serials, reference, acquisition and administrative among others; while the features are zebra crossing, ask a librarian, interlibrary loan, book holding, backup facility, OPAC, institutional repository, etc.

The University Library in 2012 adopted KOHA which was installed by Projektlink Konsult Limited. The software installation, data entry and data migration were successfully done and was immediately put into use. The software has been in use since its installation in 2010. It is 24/7 accessible to the library clientele and available on the Internet via <http://library.babcock.edu.ng>. Interestingly, Koha integrated library software that was installed at LOM Library, Babcock University has not witnessed any downtime since its installation till date. As a result, it has supported the library to manage and to provide adequate and quality services to the library users both within and beyond the library.

Data migration from XLIB ILS to KOHA ILS at LOM Library, Babcock University: A Practical Approach

Before the installation of Koha at the Babcock University Library, X-Lib was used for six years, from 2003 to 2008. After the installation of Koha, it became necessary to migrate usable data from X-Lib into Koha in order to populate the database and also to enhance access to the collections in the library. A major fear that gripped the Librarians at the BU Library was how to recover all the data inputted into X-Lib since it was proven to be corrupt with virus. However, the following procedures were followed which yielded good result.

Omeluzor, *et al.* (2012) in their study on implementation of Koha integrated library management software (ILMS): The Babcock University experience reported that X-Lib is proprietary software which did not provide any means to export out its data either as a **Comma Separated Values** (CSV) or as **Machine Readable Catalog** (MARC) data. Any of these formats would have presented a much easier conversion from X-Lib to Koha. But they were not available. The major challenge was how to get the data in the proprietary X-Lib system out in a format useful to import into Koha.

A careful analysis of the X-Lib files revealed a database system of files based on Foxpro. The key files containing relevant tables were identified. After identifying these files, the next step was to find ways to merge the files and extract the data into CSV format. Several efforts were made to use the open source programmes – “open office” and “libre office” to open and massage the data into a format that can easily be exported to CSV without success. However, Goggling for Database file (DBF) to CSV converter (Foxpro files are dbf format) turned into ‘DBFTOCSV’, a perl script that did a wonderful job of converting the Xlib dbf files into a CSV file.

After generating the CSV file, the next challenge was to convert the CSV file into a format that can be imported into Koha. The format for data import that Koha support is MARC. To convert the CSV into MARC, the very efficient utility “MarcEdit” was used. MarcEdit is a free programme, which can do all sorts of cool stuffs with your Marc data. MarcEdit was employed to finish the job and all the usable data in X-Lib was imported into Koha.

Using MarcEdit

Before data can be imported into Koha, certain data must be present in every record. This includes the code for the permanent location, the code for the current location, the item type code, and the accession number. In this case, the accession numbers were already present in the X-Lib data, but the others were added as an extra column in the CSV. The X-Lib data were cleaned up to reduce error in the catalogue. These were mainly in the area of spelling mistakes and duplicate accession numbers.

Conversion to MARC

Koha can only import data in the MARC format. This can be any flavour but must match the configured MARC flavour in a particular Koha installation. The LOM Library, Babcock University Koha uses MARC21 flavour. In order to get the CSV into MARC21, **MarcEdit delimited text translator utility** was used. The delimited text translator allows you to convert data in CSV into MarcEdit's (mrk) format. The "mrk" format, which is a text file with the appropriate mark fields given to the records was then compiled into a binary Marc file. After the conversion into MARC using MarcEdit, the generated MARC file was imported into Koha using **Bulkmarcimport script**. At the end of the conversion, a total of 23, 274 records were imported into the Koha database from X-Lib for LOM Library, Babcock University. This process gives the University library ILS a boost, because it was populated with more data which helps to reduce the amount of time that would have been spent using retrospective conversion method to input the data.

CONCLUSION AND RECOMMENDATIONS

Access to information resources available in a library collection and beyond is the main reason for adoption and installation of ILS. Traditional methods of providing information in the 21st century are aberration from the expected desire of library users. The library's decision to adopt and install software that enhances service delivery to the library clientele is paramount. The revolution and transformation brought to the libraries in Nigeria and information science environment in the last three decades has been tremendous. This would be appreciable if libraries in Nigeria explore and utilize viable automation software to enhance their services to the clientele. In addition to the underfunded nature of academic libraries towards this venture, the low will-power of library administration to totally overhaul the existing system into a most compliant type in this dispensation calls for the following recommendations:

1. The library administration should be at the fore in the course of transmitting the change necessary in the mode of service provision in academic libraries.
2. The library should be willing to go the whole mile to adopt and implement viable automation software.
3. Since funding constitutes a major setback to the realization of automating the library, adequate administrative support – financial and otherwise should be accorded the library for its success.

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