

Selection Criteria and Usage of Automation Software among Librarians in University Libraries in South-South, Nigeria

Vol. 5 No. 1

August 2020

Esoswo Francisca Ogbomo

*Department of Library and Information Science
Delta State University, PMB 1, Abraka, Delta State, Nigeria
esoobas@gmail.com*

Emuejevoke Paul Ogo

*University Library, Federal University of Petroleum Resources
PMB 1221, Effurun, Delta State, Nigeria
ogo.paul@fupre.edu.ng*

Abstract

Rationale of Study –The study was guided by four research questions which are: what are the automated services rendered in university libraries in South-South Nigeria? What criteria do librarians use in the selection of automation software in university libraries? What are the automation software packages used by librarians in university libraries? To what extent do librarians in university libraries use automation software?

Methodology – This study adopted a descriptive survey design. The population of the study was 172 librarians from 10 university libraries that use automation software in South-South, Nigeria. The instrument for data collection was a questionnaire. Frequencies and statistical mean (with the criterion mean placed at 2.50) were used to answer the research questions.

Findings – The findings of the study revealed that the automated services rendered in university libraries in South-South, Nigeria are cataloguing, circulation, and reference services. Librarians consider cost, vendor credibility, system management, support and maintenance, software reliability, functionality and user friendliness when selecting automation software for use in university libraries. KOHA, Strategic Library Automation Management, New Generation Library, and Alexandria are the software packages being used in university libraries in South-South, Nigeria, although the extent of usage is low.

Practical Implications – The findings from this study can act as a guide to library management in drawing out the criteria for consideration for selecting automation software.

Originality – The study was an original research conducted on the selection criteria and usage of automation software in university libraries in South-South, Nigeria.

Keywords

Selection criteria, usage, automation software, library software, South-South Nigeria

Citation: Ogbomo, E.F. & Ogo, E.P. (2020). Selection Criteria and Usage of Automation Software among Librarians in University Libraries in South-South, Nigeria. *Regional Journal of Information and Knowledge Management*, 5 (1),51-74.



Published by the

**Regional Institute of
Information and Knowledge
Management**

P.O. Box 24358 – 00100 –
Nairobi, Kenya

1 Introduction

Libraries are established to provide information resources and services to meet users' information needs. University libraries serve two complementary purposes; to support the university's curriculum, and the research interest of the university faculty members and students. The purpose of the library is defeated if its users' expectations are not met through the services it provides (Adeniran, 2011). The library therefore, at all times, needs to stay abreast with current trends that ensure the provision of library services is effective and efficient. The traditional methods of providing information services in Nigerian libraries is changing as a result of consistent change, development, and modifications associated with the application of Information and Communication Technologies (ICTs) worldwide. With the use of ICTs, there are changes in the way information is selected, acquired, processed, stored, retrieved and disseminated by libraries and other information centres to the end users (Wada, 2015). Blakes (2013) averred that university libraries have metamorphosed from the era of providing traditional resources and services to providing resources in an efficient manner through the use of ICTs. This is because the introduction of ICTs compels libraries to provide certain services to users in a bid to disseminate information faster and more effectively. As observed by Nkanu and Okon (2010), the use of computers has made Nigerian libraries more effective and efficient in the performance of various tasks in relation to acquisitions, cataloguing, classification, indexing, serials control, processing and circulation.

Parvez (2011) maintained that to deal with the new challenges and increasing demands of library users, libraries are reconsolidating, reshaping, redesigning and repackaging their services and information products by incorporating ICT-based products and services, and one way of doing this with regards to more computer content, is by library automation. Library automation is the application of automatic and semi-automatic data processing machines to carry out the various traditional library housekeeping operations like cataloguing, classification, circulation, and referencing, among others. This is described as the mechanisation of library activities through the use of automation software (Nebeolise & Osuchukwu, 2014). With the growing number of library collections in university libraries, and the decentralisation of library activities for effective service provision to library users, Omeluzor, et.al. (2012) affirmed that it is inevitable to use automation software that will provide on-the-spot access to information, take accurate records of library collections, identify materials on loan, link with other libraries, and provide adequate library services to the users.

A study by Kari and Baro (2014) on the use and challenges of library software in Nigerian university libraries revealed that KOHA, SLAM and Virtual library software are gaining wide acceptance in university libraries in Nigeria. They averred that most libraries use them to automate their cataloguing, acquisition, serials, online public access catalogue (OPAC), as well as charging and discharging operations. However, they observed that inappropriate selection of software has led to the failure of various automation projects in some university libraries in Nigeria. According to Mulla, Chandrashekara and Talawar (2010:14), “since the application of information technology in libraries, one of the greatest challenges before the library managers has been the selection of a good library automation software, which can cater [for] the needs of a particular library”. To forestall such challenges, selection should be done based on the guidance of a set of principles or parameters, which helps to assess the strengths and weaknesses of the software and its ability to meet the goals for which it is being acquired. This set of parameters is known as selection criteria which help a librarian to choose the most suitable and appropriate software for the library in terms of service delivery.

The library automation software market is unstable and subject to rapid expansion. Therefore, librarians should keep in mind the requirements of the library automation process and fitness for purpose of the software in terms of fulfilling the library’s requirements, and compatibility with future technology and multimedia when choosing one (Nebeolise & Osuchukwu, 2014).

2 Problem Statement

University libraries globally are constantly looking for ways to enhance their information delivery system in order to make access easier and more convenient to users. Therefore, they are taking deliberate steps to integrate in their operations the use of automation software. However, researchers observed that there seems to be a high software turnover in libraries. According to Kari and Baro (2014), and Mulla, Chandrashekara and Talawar (2010) as well as observation on the part of the researchers on librarians from the Federal University of Petroleum Resources, Effurun, libraries seem to frequently migrate from one automation software to another, or even stop the library automation project half-way after committing funds to it. This may be due to inherent technical problems in the software not initially spotted at the time of installation, unnecessary complexity in the user interface, complicated licensing terms, and maintenance bottlenecks, among others. These problems may have arisen because the library either did not do a proper feasibility study, or adhere to proper selection criteria or guidelines to ascertain the adequacy of the software.

With the frequent change in the use of library software among librarians in university libraries in South-South, Nigeria, this study examines the relationship between selection criteria and usage of automation software among librarians in university libraries in South-South, Nigeria. The aim of this study was to investigate the selection criteria and usage of automation software among librarians in university libraries in South-South, Nigeria. Specifically, the objectives of the study were to identify the automated services in university libraries in South-South Nigeria; determine the automation software packages used by university libraries; establish the criteria used by librarians in the selection of automation software; and ascertain the extent of usage of automation software among librarians in university libraries.

3 Review of Literature

It is no gainsaying that application of information and communication technologies has transformed the way librarians perform their daily tasks with regards to meeting the information needs of their users. The usage of computers has made Nigerian libraries to become more effective and efficient in the performance of various tasks in relation to acquisitions, cataloguing and classification, indexing, serials control, processing and circulation (Nkanu & Okon, 2010). The computer has thus proven its success in the area of performing library housekeeping operations in terms of acquisition, cataloguing, classification, circulation, serials control, as well as information storage and retrieval activities (Sharma, 2007). This spells the different areas of library operations where the automation software can be applied in a bid to satisfy the information needs of library users.

Automation can help the collection development and acquisition process in receiving, checking materials and clearing an order record (Onoriode & Ivwighreghweta, 2012). This module in the automation software automates the book ordering process, keeps track of items on order and therefore allows for tight control of budgets. This is so because it provides an easy means of checking for items before ordering (to avoid duplication), and enabling library users to see (and often reserve) items on order. A brief catalogue record is created at the time of ordering which allows the item to be put into circulation as soon as it is received in the library. As averred by Gbadamosi (2012), automation software helps in the management of vendors' records, generating reports on newly-selected books including online book selection, and also generating receipt reports. Automation can help acquisition librarians to acquire materials through networked technologies installed in the library. The Internet can thus be used to acquire materials online through downloads of e-books and journals, complete online edition of trade books and other

academic publishing, suppliers' own stock list, giving prices and availability including online subscription to databases (Onoriode & Ivwighreghweta, 2012).

Automation can also support cataloguing. This is usually the core module of an automated library system, without which no other modules will function. It allows bibliographic records to be created, imported to the system and parameters relating to them to be set (Sharma, 2007). Chukwuemeka, Oriogu, Ogbuiyi and Ogbuiyi (2015) inferred that while using appropriate software, cataloguers can input data for each piece of item on pre-designed work-sheets on the system, as well as edit or revise such entries. This could go beyond the traditional fields of information on the catalogue card to provide additional access points using other criteria like the affiliation of authors, keywords in the title, or thesaurus descriptors, which the capabilities of manual cataloguing and classification did not encourage. Chukwuemeka, et al. further noted that before library automation, cataloguing procedure was done manually and the whole process was time consuming which makes many academic libraries to experience backlogs, and slow flow of information materials to circulation and reference sections. With the introduction of automated systems, librarians can rely on the computer to perform all the functions of a cataloguing system and more.

The use of computers for circulation control has brought some relief through great flexibility of operation and capacity for instant recall of information on the whereabouts of a particular work. Husain and Ansari (2007) submitted that staff can set fine rules only once and the software will provide results automatically. In addition, users can easily make reservation of library sources with the aid of library software. Librarians would be able to check out library document very easily or users may do self-check. This would remove queue of users at the circulation unit in the library. Automated circulation system operation controls subsystem includes all the features and functions needed to keep track of the location of specific items, circulate them efficiently, and carry out all the charging, discharges and renewals. The system automatically checks borrower's records for overdue items, personalise messages, issue overdue notice, recall and reservation of library materials and also keeps an up-to-date record of the location of all types of library materials in circulation and keep daily record of the increase of library materials (Chukwuemeka et al., 2015).

The serials module, depending on the design of the software, is sometimes incorporated into the acquisitions module. It allows new issues of journals or magazines to be booked in without having to manually enter the details for each one. It predicts when items are due to arrive and can generate automatic claims for items not received. Most systems also create internal circulation lists for journals. An integrated library automation software will provide for online cataloguing of serials

and other periodicals, generate indexes for newspapers, journals and magazines, as well as free and open source articles online (Gbadamosi, 2012).

Reference service provides the user of library and information service an interface with the large body of knowledge to satisfy his information needs. Depending on the type of library or information centre, reference service may range from the provision of desired information to training the user to identify and locate what he needs (Obajemu et.al., 2013). It provides a means of answering user questions and providing them the required information. Library software allows for providing users current awareness on particular information of interest to library clientele. It helps to hook up to different media by which the reference librarian can communicate information that will be of benefit to the library users.

The OPAC sometimes comes as part of the cataloguing module but sometimes stands on its own. It enables library users to search the catalogue using a more user-friendly searching environment than the cataloguing module itself, with a menu-driven or windows-style interface. The type of searching that can be carried out is defined by the system or the library. There are numerous benefits that could be derived from using library software, such as OPAC, which is a great relief to users of the library catalogue. This is because different users can search for the same information at the same time using different terminals which is impossible through the traditional card catalogue (Afolabi & Abidoye, 2012).

Bruno (2010) posits that libraries should be automated regardless of size (big or small) as they perform the same function of purchasing, cataloguing and loaning materials. The library must maintain acquisition records and bibliographic data of any specific materials they possess. Also, libraries must record multiple transactions to keep track of each patron and materials; and know their status by inputting all library data into one central database. In this vein, records maintenance is now both faster and more accurate. Sharma (2007) opined that, a report generation facility is often provided as a module on its own in an automation software package, with many systems incorporated within. Circulation reports will be generated from within the circulation modules, stock reports from the cataloguing module, and so on. A separate reports module often allows for greater flexibility in the type of reports that can be generated by the system. It is beneficial for administration in taking up statistics of both the library stock and users; including the frequency of charging and discharging transactions.

The reality that no single library can be self-sufficient in terms of its resources no matter how big it is, gave rise to the networking of different libraries' collections in a manner that information materials not available in one library can be accessed in the other within the framework of a

networked system using an automated system whereby resources are pooled and made available electronically (Kari, 2013). Etebu and Asaba (2013) explained that computer-based networking system in libraries facilitates resource sharing by the interconnectivity of various libraries either institutionally, locally or internationally. Also, Sharma (2007) avers that automation software provides for the generating of requests to other libraries, notifying the users of the availability of items, and keeping records of item requests, loan or returns. With the aid of international standard protocols Like Z39.50 and Marc II embedded in the software, librarians can easily connect to the databases of other libraries using library software.

Automated library systems also have a module which enables librarians to import or export bibliographic records. This module allows the import and export of catalogue records to and from the system in UKMARC format and into and out of other systems such as the GCS catalogue. As the GCS system holds records in UKMARC format, it is essential that software should have this facility in it (Sharma, 2007). The Z39.50 is a protocol, a NISO standard developed by the library community and used to create a client application that allows users to search for and retrieve records within a bibliographic database. Z39.50 is a standard protocol that was originally developed to allow libraries to search each other's OPACs, even when they were provided by different vendors EBSCO Connect (2018). It is embedded in library automation software and provides for compatibility with other databases thereby enabling the librarian to import bibliographic data from other libraries' databases.

Indexes and abstracts play a pivotal role in information retrieval process in academic settings by facilitating rapid and easy access to information resources which, to a large extent, saves the time of the library user and leads them to pertinent and relevant sources of information (Musa, Musa & Musa, 2014). They are therefore aimed at compiling a body of literature for specific or general subject area. The basic purpose of an index or an abstract is to give effective and efficient access to information either through structured record such as books and databases or random stores of information such as information found with Internet search engines. For whatever purpose, both are tools that lead a user to extract information that is needed with no hurdles, false paths or irrelevant materials. The perfect index or abstract leads a user to totally pertinent information, seldom leads to trivial information and never, ever, leads to non-pertinent information (Cleaveland & Cleaveland, 2013).

Library automation facilitates wider dissemination of information products and services by giving room to 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) (Ukachi et.al., 2014). For quick retrieval, dissemination of information and better services to library clientele, automation is indispensable. An automated library will help its users with quick, accurate and prompt services with regards to their personal informative interests (Neelakandan, Duraisekar, Balasubramani & Srinivasa, 2010).

Some of the software packages commonly available for library automation are:

1. **KOHA Software** - According to Projektlink (2010), KOHA library management software is a web-based open source integrated library system used world-wide by public libraries, special libraries and educational institutions. It uses Web 2.0 technology for tagging and RSS feeds without vendor lock-in. It is built using integrated library system standards that use the OPAC interface and without a vendor lock-in. KOHA software has most of the features that one expects in an integrated library system. According to Projektlink (2010), the features include full catalogue; circulation and acquisitions system for library stock management; serials management module; simple, clear search interface for all users; and comprehensive acquisition options with no license fee required. Furthermore, it possesses a Structured Query Language (SQL) database (MySQL preferred) backend with cataloguing data stored in machine readable catalogue (MARC) and accessible via Z39.50.
2. **Alice for Windows (AFW) Software** - This library software package operates on single user environment as well as on multi-user environment using Novell Netware/Windows 2000 with rapid retrospective and special data protection function. It is menu-driven and is used by both library staff and users with multiple searching facilities. It has enablement for multimedia functions, that is, scanning of data videos, graphics, photographs, and sound clips in records. It boasts of special data protection features (saving of data up to last record entered in case of power failure). Also it has inbuilt tutorial modules as well as complete documentation – reference manual, tutorial manuals – and facilitates import and export of data. Modules of AFW for an academic library include acquisition, management, circulation, inquiry, periodicals, journal indexing, web inquiry, rapid retrospective conversion, inter library loans and patron self-checking (Sharma, 2007).
3. **Alexandria Software** - This is a browser-based cross-platform library automation software used by thousands of libraries around the world. It is managed by Companion Corp, which maintains different versions simultaneously, with the most recent and up-to-date version being Alexandria v7.16.1 released in the summer of 2016 (Alexandria, 2016). It has enablement for MARC cataloguing and lexile integration which supports reading programmes such as accelerated reader, due date and policy flexibility and thousands of

flexible reports. It provides for Z39.50 support that aids import of bibliographic data from all over the world. It has a web-based patron interface and backend for librarians that serve as the administrator's interface, providing access to third-party databases such as netTrekker and MARC 21 compatibility for the storing of bibliographic information and documents.

The following are the broad criteria considered for the selection of a viable library automation software:

1. **Cost** - This is a vital factor to be considered before anything is to be acquired. Obajemu et. al. (2013) recommended that cost-benefits analysis needs to be carried out before acquiring software. The cost of procuring the software, training cost, maintenance cost and other implicit costs must be thoroughly calculated in relation to what benefits the software will bring to the library. In this regard, due consideration must be given to the total amount voted for the library for a particular year. All the money allocated to the library cannot be spent on the purchase of software alone. Ukachi et al. (2014) posited that when selecting library automation software, one must ensure that it will work well with the existing equipment in order to reduce cost accruable from acquiring new facilities.
2. **Supplier or vendor credibility** - According to Osaniyi (2010:162), "a vendor can put up a road block to the successful implementation of a software package by not responding fast enough when a client is in need of assistance". Hassan (2011) listed eight essential factors for the success and effective management of a library software system, and five of them are connected with the vendor and support functions, including, the availability of local and regional support, the cost of ongoing support, the ongoing viability of the system vendor, the availability of professional support and technical support. Hassan (2011; Osaniyi (2010) pinned that problems in any of these can limit the confidence in the ability of the system to serve its purpose and cause serious problems in service provision. Bilal (2014) is of the view that the viability and performance track record of the vendor are probably the most important to the success of a new system. Therefore, the vendor's credibility is a dominant factor to be considered when selecting a viable automation software in libraries.
3. **Services** - The most important factor is the service part of any software package for the library, because with it, the librarian can serve the people effectively, efficiently as well as rapidly (Nebeolise & Osuchukwu, 2014). The services include core services, enhanced services and added services. A good software should be able to provide for the operations

in the library. These are acquisitions, cataloguing, circulation, online-public access catalogue, serials management, report generator, interlibrary loan, community information, import or export of data from other libraries and databases, and providing reference service.

4. **System support and maintenance** - One should examine the support and maintenance arrangements being offered by the vendor or supplier carefully. Maintenance may include removing the bugs or errors that might become evident in the software as it is used for a greater variety of applications and improving the software. Considerations need to be made for the various factors that aid support and maintenance of the software (Nebeolise & Osuchukwu, 2014). Nebeolise and Osuchukwu further elaborated that training, maintenance and documentation should be included in the customer support services. This can be done in terms of publications containing information about latest development of the software.
5. **Training** - It has been observed that the success of automation in the university library depends largely on the ability of staff to facilitate and implement the process. Proper, frequent, and regular in-house ICT training is a necessity if the maximum benefit is to be gained from the automation of library services (Nok, 2006). Similarly, Hassan (2011) is of the view that in order to ensure proper usage of software, the manpower to handle installation, alternation and alignment of system processes, training of the staff and users of the system must be considered. It must be realised that librarians will not be able to make good use of computer equipment until they are provided with the know-how required to use it. So, it is necessary to make training arrangements for the professional development of librarians.
6. **Software reliability** - Reliability implies the fault tolerance of the software or the ability of the software to recover from (and withstand) component or environmental failure, which tends to define its quality. Osaniyi (2010) averred that the reliability of a software is an important component of its quality because the quality of a package that the vendor delivers has a large influence on the implementability of the package. Showale and Longe (2006) argued that quality is more than the absence of bugs. Software quality criteria include correctness, reliability, modifiability, maintainability, usability and documentation. These should be considered when selecting viable software.
7. **Documentation** - It is imperative to know if there is provision for a manual or document with detailed written instruction on how to use the software package after the training

programme to serve as a reference point when faced with difficulty in the future. It is also important to know whether they have any regular newsletter or user information up-date publication regarding the library software (Sharma, 2007). Osaniyi (2010) opined that documentation that come with software packages is invaluable even if it is seldom used. Automation software packages come with different types of documentation. These could be for installation, users or the administrator, upgrade and so on. Having the manual is not the only important thing. The manuals must be well written and with well-organised content.

8. **Performance** - Adogbeji and Okoloko (2010) recommended that consultations be made with libraries that have automated their services about the performance and functions of the software. This is because the experiences of the other librarians who have used the software are more valuable than the assurances of the developers. Also, the vendors should demonstrate their product. Library and computer software experts should prepare an observation report of software facts on how much it meets or does not meet the requirements. The performance of the software should be evaluated in the area of speed and response time to queries, file organisation, operating system, number of records, and so on. (Oketunji, 2006). Corroborating this view, Nebeolise & Osuchukwu (2014) explained that provision for searching the OPAC and web simultaneously using key word search, search response time, search options, back-up facilities, and database security, underpins the performance of any library automation software.
9. **Security** - Security has become an important aspect and an integral part of all the phases of any software development. The trustworthiness of any software, either open source or closed source, depends on certain key aspects of the product design and development. These include the expertise and dedication of the developers to create a secure product, quality of tools used in the development, and the level of testing carried out before releasing the product (Vadalasetty, 2003). Murray (2010) avers that security mechanisms that prevent the software database from being misused by the users and other people should be considered before acquisition. These include provision of user identification, access restrictions to certain records, as well as checking-in and checking-out of users. Security breaches are an increasing phenomenon because as more databases are made accessible via the Internet and web-based applications, their exposure to security threats will rise. The objective in selecting a software is to reduce susceptibility to these threats which occur when users enter malicious code that 'trick' the database into executing unintended commands that will suit their own selfish purpose.

10. **User-friendliness** - The system should be easy to use and should provide both experienced and inexperienced users with short cuts and flexible tools. Also it should be easy to learn, menu-driven and command mnemonic based. The graphical user interface should be one that the users can easily interact with, is multi-purpose, versatile, open-ended, easy to use, and should employ tasteful and attractive graphics (Oketunji, 2006). Osaniyi (2010) listed amongst others, the ease of use, ability to search and retrieve library records efficiently by various fields and at a fast speed, multi-user package and menu-driven options as priority requirements for the choice of automation software for the Babcock library automation project. Omeluzor et.al. (2012) posited that amongst others, librarians should realise that in choosing an automation software, they must consider the flexibility (easy to customise), accessibility (easy for collaboration, flow of data) and dependability (manageable, easy to fix bugs).
11. **Software upgrade and support** - A look should be taken at what it will take to upgrade the software in the future. The considerations should cover the cost, training, technical expertise and other modalities involved to be able to upgrade the software as and when due. Adekanye (2011) noted that libraries need software that is well supported and used by many other libraries with the hope of forming a user group to support common problems and offer solutions that would lead to continuing improvements. Among the criteria listed by Kroski (2012) for the effective evaluation of software include ability to modify the package to meet the library's new requirements as they become known in the future.
12. **Copyright and licensing considerations** - All commercial software is copyright protected. The software package should contain a licensing statement through which the library can obtain upgrades at far less than the full market price, to which the purchaser agrees by the action of opening the package (Nebeolise & Osuchukwu, 2014). The license should allow for upgrades and remove unnecessary restrictions from the users. A study by Omeluzor et.al. (2012) revealed that the KOHA software was adopted for the Babcock library because its modification was not restricted since it was free and open source software. Thus, they could add their own interfaces and features that will suit the services of the library and its users. Therefore, it is of importance that the selection committee of the automation project ensures that the copyright agreement of the software is flexible so as to allow for easy modification and upgrade.
13. **Integration of the software** - Nebeolise and Osuchukwu (2014) recommended that a good library software package should be integrated for the entire range of library

operations such as acquisitions, cataloguing, circulation, OPAC, serial management, reference service. Hence, it should be a major consideration by libraries and librarians because it will enable the different operations to be linked in such a way that a modification or addition in one aspect will lead to a change in the other. Library management software must be robust, integrated, and interoperable with other library technologies, and capable of delivering traditional as well as new functionalities to handle heterogeneous information (Osaniyi, 2010).

14. **Interoperability (portability) and compatibility** - To be considered is the interoperability of the software with software in other libraries. The compatibility of the software with available or common computer hardware systems should be considered so as not to be forced into purchasing a new set of hardware. The software should be compatible with MARC 21 and Z39.50 to store files in the database and to retrieve and import data from other databases. Whether the software has the facility to import bibliographic data available in ISO 2709 format and at the same time export data in this format should also be considered (Devi & Raghuveer, 2014). Also, Xie (2006) opined that the library automation software needs to be interoperable with other systems to which it is connected. This allows each system to evolve independently without sacrificing their ability to communicate with each other, and thus the repository software should support two basic interoperability protocols, namely, Z39.50 and OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting). Adogbeji and Okoloko (2010) opine that to ensure the effectiveness of software usage in a university library, the library system must speedily access the information bank, and be compatible in transferring data from database to the software.
15. **Connectivity or networking** - The software should be integrated and able to connect to the network (LAN or WAN) to allow access by users from anywhere in the world with their access codes or passwords (Sharma, 2007). Of major importance to library automation is the ability to connect to all kinds of networks; whether through local or international networks and provide the means of facilitating ease of access from anywhere regardless of the location. Obuh and Ogheneme (2012) avers that since automated libraries involve networks of all kinds and use different hardware and software platforms, all of them should follow internationally agreed upon standards to enable interconnectivity to a diversity of systems and to enable mutual sharing of resources and exchange of data between them.

16. **Support for international standards and capabilities** - Ideally, a software product should have internationally known standards like Z39.50 and MARC capabilities that will allow the cataloguer to search one or more library catalogues for relevant cataloguing records. But many software companies do not have these capabilities or only a variation of it leading to additional cost of the project and difficulty in the import and export of data (Kroski, 2012). Devi and Raghuv eer (2014) listed some criteria for automation software selection, and some of them include the software's possession of compatible Z39.50 features to retrieve and import data from other databases, compatibility with MARC 21 for storing MARC records, and whether the software has the facility to import bibliographic data available in ISO 2709.
17. **Data backup and recovery** - This is the creation of a copy or more of the software's data files to use in case of data loss caused to hard disk, crash, fire, theft, power outage and accidental deletions. Having a backup plan and recovery provisions will reduce or eliminate the need for re-entering lost data. Bilal (2014), in his work on library automation concepts and practical systems analysis, recommended that every library must develop a backup strategy for the automation software as part of library security and/or network plans when selecting a software. The software package should provide modalities and instructions to easily backup data files or recover lost files when the need arises. Wale (2011) cited in Bilal (2014) posit that the service contract should include provisions for data backup, security, privacy, disaster recovery, network outage procedures, level of service availability and backup for network connectivity in case a server goes down. Major factors to consider in making provision for a backup plan are capacity, reliability, extensibility, speed and cost of the backup solution.

4 Methodology

This study adopted the descriptive survey research design. The population of the study was 172 librarians in university libraries in South-South Nigeria. A structured questionnaire was used to collect data from the respondents. The questionnaire was distributed on face to face basis by the researchers and also with the help of research assistants. The questionnaires were dropped at the librarians' offices and was retrieved at a later date. The data obtained from the administered questionnaires was analysed using descriptive statistics. While frequencies were used to answer research questions one and three, statistical mean was used to answer research questions two and four and the criterion mean is placed at 2.50. The choice of statistics was based on the descriptive nature of the research.

5 Findings

The respondents for this research are the librarians from university libraries in South-South Nigeria that is using automation software. The population of the study is shown in Table 1.

Table 1: Distribution of Librarians

| State | Name of University Libraries | Number of Librarians |
|--------------|--|----------------------|
| Akwa-Ibom | University of Uyo Library, Uyo | 23 |
| Bayelsa | Federal University Library, Otuoke | 11 |
| | Niger Delta University Library, Wilberforce Island | 20 |
| Delta | Federal University of Petroleum Resources, Effurun | 26 |
| | Edwin Clark University, Kiagbodo | 2 |
| Edo | Igbinedion University Library, Okada | 7 |
| | Benson Idahosa University Library, Benin City | 12 |
| | John Harris Library, University of Benin, Benin City. | 30 |
| Rivers | Donald Ekong Library, University of Port-Harcourt, Choba | 31 |
| | Rivers State University of Science and Technology Library, Diobu | 10 |
| Total | | 172 |

One hundred and seventy-two (172) copies of the questionnaire were distributed and a total of 109 were duly completed, returned, and found usable, therefore there was 63% response rate.

Research Question 1: What are the automated services rendered in university libraries in South-south Nigeria?

Table 2: Automated Services Rendered in University Libraries

| Automated Services Rendered in my Library | Agree | | Disagree | | Total | |
|---|-------|------|----------|------|-------|-------|
| | No. | % | No. | % | No. | % |
| Cataloguing services | 105 | 96.3 | 4 | 3.7 | 109 | 100.0 |
| Circulation services | 104 | 95.4 | 5 | 4.6 | 109 | 100.0 |
| Online Public Access catalogue | 102 | 93.6 | 7 | 6.4 | 109 | 100.0 |
| Report generation | 87 | 79.8 | 22 | 20.2 | 109 | 100.0 |
| Reference services | 82 | 75.2 | 27 | 24.8 | 109 | 100.0 |
| Acquisition services | 74 | 67.9 | 35 | 32.1 | 109 | 100.0 |
| Serials management | 74 | 67.9 | 35 | 32.1 | 109 | 100.0 |
| Import/export of bibliographic records | 68 | 62.4 | 41 | 37.6 | 109 | 100.0 |
| Selective dissemination of information | 54 | 49.5 | 55 | 50.5 | 109 | 100.0 |
| Digitization of information resources | 42 | 38.5 | 67 | 61.5 | 109 | 100.0 |
| Indexing and abstracting services | 41 | 37.6 | 68 | 62.4 | 109 | 100.0 |
| Inter library loan services | 21 | 19.3 | 88 | 80.7 | 109 | 100.0 |

From Table 2 it can be seen that cataloguing services 105(96.3%), circulation services 104(95.4%), online public access catalogue 102(93.6%), report generation 87(79.8%), reference services 82(75.2%), acquisition services and serials management 74(67.9%) and import/export of bibliographic records 68(62.4%) are the automated services rendered in the university libraries. This implies that the respondents agreed that the automated services rendered in the university libraries are cataloguing, circulation, online public access catalogue, report generation, reference, acquisition, serials management, and import/export of bibliographic records services.

Research Question 2: What are the automation software packages used by librarians in university libraries?

Table 3: Automation Software Packages used by Librarians in University Libraries

| Automation Software Packages used by Librarians in University Libraries | Frequency | Percentage (%) |
|---|-----------|----------------|
| KOHA | 47 | 43.1 |
| Strategic Library Automation Management (SLAM) | 44 | 40.4 |
| New Gen Lib | 15 | 13.8 |
| Alexandria | 13 | 11.9 |
| VTLS | 7 | 6.4 |
| Millennium | 5 | 4.6 |
| Graphical library automation software (GLAS) | 4 | 3.7 |
| TINLIB | 3 | 2.8 |
| Alice for Windows | 2 | 1.8 |
| Greenstone | 2 | 2.8 |
| Bibliofile | 2 | 1.8 |
| X-LIB | 1 | 0.9 |
| CDS/ISIS | 1 | 0.9 |
| Adora | 1 | 0.9 |

From Table 3, it has shown that KOHA- 47(43.1%), SLAM- 44(40.4%), New Gen Lib- 15(13.8%), Alexandria- 13(11.9%), VTLS- 7(6.4%), Millennium- 5(4.6%), GLAS- 4(3.7%), and TINLIB 3(2.8%), Alice for Windows, Greenstone and Bibliofile - 2(1.8%), X-LIB, CD/ISIS and Adora- 1(0.9%) are the automation software packages used by librarians in the provision of library services in the university libraries. In conclusion, the automation software packages used by librarians in the provision of library services in university libraries include KOHA, SLAM, New Gen Lib, Alexandria, VTLS, Millennium, GLAS, TINLIB, Bibliofile, Alice for Windows, Greenstone, X-LIB, CD/ISIS and Adora. This implies that in the theory and practice of library automation,

librarians or libraries do not stick to a particular automation software which is not very encouraging.

Research Question 3: What criteria do librarians use in the selection of automation software in university libraries?

Table 4: Criteria for the Selection of Automation Software

| Criteria for the Selection of Automation Software | SA | A | D | SD | Mean |
|---|----|----|---|----|------|
| The cost of the software (purchase, installation, upgrade, training costs) | 69 | 40 | 0 | 0 | 3.63 |
| vendor's credibility/competence (i.e company's longevity, reputation, software designer, version of the software) | 70 | 39 | 0 | 0 | 3.64 |
| Provisions for core, added and enhanced library services | 66 | 41 | 2 | 0 | 3.59 |
| System management, support and maintenance (e.g, search options, software upgrade) | 69 | 40 | 0 | 0 | 3.63 |
| Provision for training of librarians | 54 | 53 | 2 | 0 | 3.48 |
| Software reliability | 74 | 35 | 0 | 0 | 3.68 |
| Documentation | 40 | 67 | 2 | 0 | 3.35 |
| Training for software usage | 47 | 59 | 3 | 0 | 3.40 |
| Functionality and usability | 75 | 34 | 0 | 0 | 3.69 |
| Security provisions | 55 | 52 | 0 | 0 | 3.51 |
| User friendliness (Well-designed screens, logically arranged functions/modules with extensive help messages). | 83 | 26 | 0 | 0 | 3.76 |
| Copyright and licensing agreement | 59 | 49 | 0 | 0 | 3.55 |
| Integration of all the range of operations in the library (e.g. cataloguing, circulation, serials management, OPAC, reporting etc.) | 78 | 30 | 0 | 0 | 3.72 |

| | | | | | |
|---|-------------|----|---|---|------|
| Portability/interoperability(easily movable to other operating systems) | 68 | 40 | 0 | 0 | 3.63 |
| Connectivity/networking | 77 | 31 | 0 | 0 | 3.71 |
| Support for international standards (MARC, Z.39.50, etc.) | 49 | 56 | 4 | 0 | 3.41 |
| Data backup and recovery | 78 | 31 | 0 | 0 | 3.72 |
| Aggregate Mean | 3.60 | | | | |
| Criterion Mean | 2.50 | | | | |

Key: SA= Strongly Agreed, A= Agree, D= Disagree, SD= Strongly Disagreed

Table 4 shows that with an aggregate mean of 3.60, which is more than the criterion mean of 2.50, it can be concluded that the criteria for the selection of automation software by librarians is high. The implication of this is that the librarians consider cost of software, vendor credibility/competence, system management, support and maintenance, software reliability, functionality and usability, and user friendliness while selecting automation software.

Research Question 4: What is the extent of automation software usage among librarians in university libraries?

Table 5: Extent of Automation Software Packages Usage among Librarians (n=109)

| Extent of Automation Software Usage among Librarians | VGE | GE | LE | VLE | Mean |
|---|------------|-----------|-----------|------------|-------------|
| Carry out acquisition of library materials | 14 | 20 | 39 | 35 | 2.12 |
| Charging and discharging information materials | 36 | 47 | 48 | 8 | 3.02 |
| Provide selective dissemination of information services | 12 | 12 | 55 | 29 | 2.06 |
| Generate library reports | 26 | 49 | 26 | 8 | 2.85 |
| Create bibliographic records | 32 | 50 | 19 | 7 | 2.99 |
| Provide an Online Public Access Catalogue (OPAC) | 41 | 43 | 16 | 9 | 3.06 |

| | | | | | |
|--|-------------|----|----|----|------|
| Market library products and services (Promote specific programmes and or services) | 10 | 13 | 37 | 49 | 1.85 |
| Provide interlibrary loan services to users | 7 | 10 | 30 | 62 | 1.65 |
| Increase staff productivity | 34 | 50 | 16 | 8 | 3.02 |
| Import and export library records | 10 | 14 | 60 | 24 | 2.09 |
| Provide current awareness services as at when necessary | 9 | 9 | 46 | 33 | 2.06 |
| Communicate with users and respond to their queries | 15 | 46 | 26 | 11 | 2.60 |
| Find out/track the location of information materials in the library | 39 | 45 | 14 | 8 | 3.08 |
| Integrate library operations | 33 | 46 | 19 | 8 | 2.98 |
| Provide real time library services to users | 10 | 26 | 53 | 20 | 2.24 |
| Serials services | 17 | 32 | 32 | 28 | 2.35 |
| Indexing and abstracting | 8 | 18 | 49 | 33 | 2.01 |
| Digitization of information materials | 14 | 6 | 52 | 36 | 1.98 |
| Aggregate Mean | 2.45 | | | | |
| Criterion Mean | 2.50 | | | | |

Key: VGE= Very Great Extent, GE= Great Extent, LE= Low Extent, VLE= Very Low Extent

The result in Table 5 shows that with an aggregate mean of 2.45 which is less than the criterion mean of 2.50, it can be concluded that the extent of usage of automation software packages among librarians in university libraries is low. This implies that even though the librarians claimed to be using automation software for the provision of library services in their various libraries, the extent of the usage is low. This could mean that the librarians may have other alternative means of providing information to their users other than the usage of automation software packages.

6 Discussions

The study revealed that a majority of librarians in university libraries rendered automated services which include cataloguing service, circulation service, OPAC services, report generation, reference services, acquisition services, serials management and import/export of bibliographic records. This

conforms to the findings of Kari and Baro (2014) that most libraries use software to automate their cataloguing, acquisition, serials, OPAC, charging and discharging operations in university libraries in Nigeria. In a similar study by Okewale and Adetimirin (2011), the University of Lagos and Covenant University libraries use their automation system to create bibliographic databases for cataloguing, serials control, acquisition, circulation and OPAC searching. This finding could mean that most automated libraries in South-South, Nigeria use the software mostly for the core library functions to make major impact in information dissemination and delivery.

Another finding of the study is that librarians in university libraries in South-South, Nigeria use KOHA, SLAM, New Gen Lib, Alexandria, VTLS, Millennium, GLAS, and TINLIB software for their library operations. KOHA has the highest level of adoption as it has been used by a majority of university libraries in Nigeria. This is in agreement with the findings of Edem (2016), that KOHA is not only the most widely adopted, but also the most widely used currently in university libraries in Nigeria. This finding also agrees with the observation of Kari and Baro (2014) that the KOHA and SLAM software is gaining wider acceptance in university libraries in Nigeria, which according to the researchers, may be an indication that they are the most suitable library software to manage library operations in university libraries.

The study revealed that the criteria that librarians consider for the selection of automation include the cost of software, vendor credibility/competence, system management, support and maintenance, software reliability, functionality and usability, user friendliness, data back-up and recovery, connectivity/networking, integration of the range of operations, and provision of core services in the library. This finding supports Taole (2008) study that the benchmark for the selection of automation software in libraries includes vendor competence, functionality and usability of the software, system management, support and training for the software usage. These findings could be attributed to the fact that majority of librarians in Nigeria are knowledgeable and abreast of the requirements that make up viable software.

Finally, the study revealed that the extent of usage of automation software in university libraries in South-South, Nigeria is low. This agrees with the report of Otunla (2016) that despite the early adoption of automation in Nigerian academic libraries, many academic libraries are still struggling to automate their services today. Libraries mostly use the cataloguing and circulations modules while acquisitions and serials modules are rarely used. Similarly, Eke (2009) had reported that most academic libraries in Nigeria use their automation software for cataloguing and classification to a large extent, and then for acquisition and circulation. It could be that library management in universities in South-South, Nigeria may have decided to automate only the core library functions

as the limited funds could carry. Also, the library could be using alternative means of providing library services other than the library software. This means that irrespective of location, selection criteria and use of automation software among librarians do not differ.

7 Conclusion and Recommendations

The study was done in order to ascertain the selection criteria and usage of automation software among librarians in university libraries in South-south, Nigeria. The study identified cataloguing, circulation, OPAC, report generation, reference, acquisition, serials management and import/export of bibliographic records as the services rendered by university libraries in South-south, Nigeria. From the study, it was established that librarians consider cost of software, vendor credibility/competence, system management, support and maintenance, software reliability, functionality and usability, and user friendliness of the automation software while selecting it for acquisition in their libraries. Furthermore, the study determined the software packages used in university libraries to include, KOHA, SLAM, New Gen Lib, Alexandria, VTLS, Millennium, GLAS, TINLIB for their library operations, and ascertained that the extent of usage of automation software among librarians is low. The study concludes that the selection criteria such as cost of software, vendor credibility/competence, system management, support and maintenance, software reliability, functionality, usability and user friendliness do not influence the usage of automation software among librarians in university libraries in South-South, Nigeria.

Based on the findings of the study, the following recommendations are hereby made:

1. From the results of analysis, university librarians in South-South Nigeria do render automated services in the core areas of their operation instead of all areas. This should not have been so. Therefore, they are advised to increase their efforts in rendering services with the use of automation software to cover all areas of their operations.
2. Library management should ensure that the software packages they adopt at any time can easily be managed and maintained. This can be achieved through rigorous feasibility study. This can be achieved through policy formulation and strict adherence to the policy.
3. The extent of usage of automation software is low. Therefore, the library management and librarians should take it as a matter of priority to endeavour to carry out all their library operations using automation software. This can be effected by the implementation of the policies formulated on the use of automation software by the management of the universities.

References

- Adekanye, E.A. (2011). Computerization of the Fatiu Ademola Akesode library, Lagos state university. *Library Philosophy and Practice*. Retrieved from www.webpages.uidaho.edu/mbolin/adekonye.pdf
- Adeniran, P. (2011). User satisfaction with academic libraries services: Academic staff and students perspectives. *International Journal of Library and Information Science*, 3 (10), 209-216.
- Adogbeji, B.O., & Okoloko, V.N. (2010). Software and their effectiveness in information management in Nigerian university and special libraries. *Delta Library Journal*, 4 (1&2), 54-63.
- Adebika, T.O. (2007). An assessment of the library application software packages in selected academic libraries in Nigeria. *The Information Manager*, 7(2), 21-27.
- Afolabi, A. F., & Abidoye, J. A. C. (2012). *The integration of information communication technology in library operations towards effective library services*. Proceedings of the 1st International Technology, Education and Environment Conference, African Society for Scientific Research (ASSR) (pp. 620-628). Retrieved from <http://www.hrmars.com/admin/pics/267.pdf>
- Alexandria (2016). *Alexandria for universities*. Retrieved from www.goalexandria.com/using-alexandria/university-library-software/
- Barner, k. (2011). The Library is a growing organism: Ranganathan's fifth law of library science and the academic library in the digital era. *Library Philosophy and Practice*. Retrieved from <http://www.webpages.uidaho.edu/~mbolin/barner.htm>
- Bilal, D. (2014). *Library automation: Core concepts and practical analysis*. California: ABC-CLIO, LLC
- Blakes, E.F. (2013). University library organization and administration in the 21st century. In V. Nwachukwu & E.F. Blakes (Eds.), *University Library Management: 21st Century perspective* (pp. 1-16). Port-Harcourt: Ulamba Publishers.
- Breeding, M. (2012). Open source integrated library systems. *ALA Tech Source*. Retrieved from <http://www.alatechsource.org/ltr/open-source-integrated-library-systems>
- Bruno, G (2010). The advantage of automation in library structure. Retrieved from http://webcache.googleusercontent.com/search?cache=1be5yDrwvz0j:www.ehow.com/list_5845174_advantages-automation-library-structure.html+benefit-of-automation+process+in+libraries&cd=en&ct=clnk&gl=ng
- Chukwuemeka, A.O., Oriogu, C.D., Ogbuiyi, D.C., & Ogbuiyi, S.U. (2015). Influence of automated cataloguing on circulation systems operation on library services in three selected university libraries in South-Western Nigeria. *IOSR Journal of Humanities and Social Science*, 20(5), 58-63.
- Cleaveland, D. B., & Cleaveland, D. A. (2013). *Introduction to indexing and abstracting* (4th ed.). California: ABC-CLIO, LLC.
- Devi, G. R., & Raghuvver, K. (2014). Hardware and software selection for library automation. *International Journal of Science and Research*, 3 (12), 1872-1876.
- EBSCO Connect (2018). *What is Z39.50*. Retrieved from http://support.epnet.com/knowledge_base/detail.php?id=768
- Edem, M.B. (2016). Adoption of software packages in university libraries in Nigeria. *Library Philosophy and Practice*. Retrieved from <http://digitalcommons.unl.edu/libphilprac/1342>
- Eke, H.N. (2009). Assessment of the X-Lib and Lib+Library software in academic and special libraries in Nigeria. (A master's Project, Department of Library and Information Science, University of Nigeria, Nsukka). Retrieved from <http://www.unn.edu.ng/publications/files/images/HELEN%20NNEKA%20EKE%20MASTERS%20THE%20SIS%20LIBRARY%20SCIENCE.pdf>
- Etebu, A., & Asaba, J. (2013). Library materials circulation in the 21st century in universities. In V. Nwachukwu & E.F. Blakes (Eds.), *University Library Management: 21st Century perspective* (pp. 167-177). Port-Harcourt: Ulamba Publishers
- Free Software Foundation (2015). *Categories of free and nonfree software*. Free Software Foundation. Retrieved from <http://www.gnu.org/philosophy/categories.html#ProprietarySoftware>
- Gbadamosi, B.O. (2012). Emerging challenges to effective library automation and an e-library: The case of Emmanuel Alayande College of Education, Oyo, Nigeria. *Library Philosophy and Practice*. Retrieved from <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1997&context=libphilprac>
- Hassan, N. (2011). Issues and challenges in open source software environment with special reference to India. Retrieved from http://crl.du.ac.in/ical09/papers/index_files/ical-43_144_317_1_RV.pdf

- Husain, S., & Ansari, M. A. (2007). Library automation software packages in India. A study of cataloguing modules of Alice for windows, Libsys and Virtual. *Annals of Library and Information Studies*, 54, 146-151.
- Kari, K.H., & Baro, E.E. (2014). The use of library software in Nigerian university libraries and challenges. *Library Hi Tech News*, 31(3), 15-20. doi: <http://dx.doi.org/10.1108/LHTN-09-2013-0053>
- Kroski, E. (2012). *How to automate a small library*. Retrieved from https://www.webjunction.org/documents/webjunction/How_to_Automate_a_Small_Library.html
- Mulla, K.R., Chandrashekara, M., & Talawar, V.G. (2010). Usage and performance of various library software modules in Engineering Colleges of Karnataka. *DESIDOC Journal of Library & Information Technology*, 30(3)13-22.
- Muller, T. (2011). How to choose a free and open source integrated library system. *OCLC Systems & Services: International digital library perspectives*, 27 (1) 57-78.
- Murray, M.C. (2010). Database security: what students need to know. *Journal of Information Technology Education: Innovations in Practice*, 9. Retrieved from <http://jite.org/documents/Vol9/JITEv9IIPp061-077Murray804.pdf>
- Musa, A. U., Musa, A. M., & Musa, S. (2014). An assessment of indexing and abstracting services in Nuhu Bamalli Polytechnic Library, Zaria, Nigeria. *Research on Humanities and Social Sciences*, 4(8), 21-29. Retrieved from iiste.org/Journals/index.php/RHSS/article/download/12474/13082
- Nebeolise, L.N., & Osuchukwu, N.P. (2014). Issues in selecting appropriate software for automation and management of academic libraries in Nigeria. *International Journal for Innovation Education and Research*, 2 (10), 32-47.
- Neelakandan, B., Duraisekar, S., Balasubramani, R., & Srinivasa, R.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), 149-167. Retrieved from <http://www.ipublishing.co.in/jarvol1no12010/EIJAER1014.pdf>
- Nkanu, W.O., & Okon, H.I. (2010). Digital divide: Bridging the gap through ICT in Nigerian libraries. *Library philosophy and practice*. Retrieved from <http://www.webpages.uidaho.edu/~mbolin/nkanu-okon.htm>
- Nok, G. (2006). The challenges of computerizing a university library in Nigeria: The case of Kashim Ibrahim Library, Ahmed Bello University, Zaria. *Library Philosophy and Practice*. Retrieved from <http://www.webpages.nidaho.edu/moolin/nok.htm>
- Obajemu, A.S., Osagie, J.N., Akinade, H.O.J., & Ekere, F.C. (2013). Library software products in Nigeria: A survey of uses and assessment. *International Journal of Library and Information Science*, 5 (5) 113-125. DOI: 10.5897/IJLIS2013.0353
- Obuh, A. O., & Ogheneme, A. (2012). Library automation: The ingredients for systems hardware and software interoperability. *International Journal of Library Science*, 1(2), 23-27. Retrieved from <http://article.sapub.org/10.5923.j.library.20120102.02.html>
- Ogbenege, A., & Adetimiri, J. (2013). Selection and use of KOHA software in two private Nigerian universities. *Library Hi Tech News*, (6), 12-16. DOI 10.1108/LHTN-04-2013-0020
- Oketunji, I. (2006). Choice of library application software and their sustainability: Necessary guidelines. In current trends in ICT: Application to Technical Services. Abuja: NLA (Cat& Class Section).
- Okewale, O., & Adetimirin, A. (2011). Information use of software packages in Nigerian university libraries. *Journal of Information Technology Impact*, 11 (3), 211-224.
- Omeluzor, S.U., Adara, O., Ezinwayi, M., Bamidele, A.I., & Umahi, F.O. (2012). Implementation of Koha integrated library management software (ILMS): The Babcock University experience. *Canadian Social Science*, 8(4), 211-221. Retrieved from <http://cscanada.net/index.php/css/article/viewFile/j.css.1923669720120804.1860/2825>
- Onoriode, O.K., & Iywichreghweta, O. (2012). Automation in library's collection development and acquisition process in academic institutions in Delta central district of Delta state, Nigeria. *International Journal of Library Science*, 1(4), 66-71.
- Osaniyi, L. (2010). Implementability and supportability of library management systems: Case study of X-lib library automation system. *Acta SATECH: Journal of Life and Physical Sciences* 3(2): 158 – 168.
- Otunla, A. O., & Akanmu-Adeyemo, E. A. (2010). Library automation in Nigeria: The Bowen University experience. *African Journal of Library, Archives and Information Science*, 20 (2), 93-102.
- Otunla, A.O. (2016). Current status of automation in academic libraries in Osun State, Nigeria. *Journal of Applied Information Science and Technology*, 9 (2), 30-39.

- Parvez, M. (2011). Development in library services with the advent of ICT based products & services: a continuous process. *International Journal of Digital Library Services*, 1(2), 2-8.
- Projektlink (2010). *Introducing Koba, an integrated library management system*. Ibadan: Blue Print Concept.
- Sharma, S.D. (2007). *Library automation software packages used in academic libraries Of Nepal: A comparative study*. (Associateship Dissertation, National Institute of Science Communication and Information Resources, India). Retrieved from <http://eprints.rclis.org/22581/1/Sabitri%20final%20thesis.pdf>
- Showale, A. A., & Longe, H.O.D. (2006). *Open source software quality assurance process*. In A. Itegbeye & I. Oyeyinka (pp. 172 – 182). Conference Proceedings of the 20th Annual National Conference of the Nigeria Computer Society.
- Taole, N. (2008). *Evaluation of the INNOPAC library system in selected consortia and libraries in the Southern African Region: implications for the Lesotho library Consortium*. (DPhil thesis. Pretoria: University of Pretoria).
- Ukachi, N. B., Nwachukwu, V. N., & Onuoha, U. D. (2014). Library automation and use of open source software to maximize library effectiveness. *Information and Knowledge Management*: 3 (4), 78-81.
- Vadalasetty, S. R. (2003). *Security concerns in using open source software for enterprise requirements*. Retrieved from <https://www.sans.org/reading-room/whitepapers/awareness/security-concerns-open-source-software-enterprise-requirements-1305>
- Wada, I. (2015). Digital librarians' competency in managing digitized library: A requirement for cloud computing implementation in libraries. *Information and Knowledge Management*, 5(4), 83-93.
- Xie, H. (2006). Evaluation of digital libraries: Criteria and problems from users' perspectives. *Library and Information Science Research*, 28(3), .433-452