

## ASSESSMENT OF THE USE OF OPEN SOURCE LIBRARY SOFTWARE IN UNIVERSITY LIBRARIES IN SOUTH-SOUTH NIGERIA

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**Abstract** - The study assessed the use of open source library software in university libraries in South-south, Nigeria. The survey type of descriptive research design was adopted for a population of 186 librarians from 15 selected universities in South-south, Nigeria. The entire population was adopted as the sample size for the study using the total population sampling technique. The instrument used for data collection was a self-structured questionnaire. Out of the 186 copies of questionnaire administered, 157 were retrieved and found useable, therefore constituting 84% response rate. The data were analysed using descriptive statistics. The findings revealed that the various open source library software used in university libraries in South-south, Nigeria include KOHA, NewGenLib, DSpace, and Evergreen. The study further revealed that the level of use of open source library software in the university libraries is very high. However, some factors such as inadequate power supply, apathy on the part of library staff, insufficient manpower, lack of supervision, lack of technical knowledge from the library staff, maintenance cost, lack of training and re-training of staff and cost of procurement of the hardware/software affect the effective use of open source integrated library systems in the libraries under study. Thus, the study recommends that university management should budget adequately for both the procurement of hardware/software as well as training and re-training of library staff in order to achieve effective utilization of open source library software.

**Keywords:** Open Source; Library Software; Integrated Library System; Library Management System; University Libraries; South-South Nigeria

### INTRODUCTION

Advancement in technologies has led to the development of what is today known as open source library software. Reddy and Kumar (2013) defined open source library software as software used in libraries whose source code is available under a license (or arrangement such as the public domain) that permits users to study, change, and improve the software, and to redistribute it in modified or unmodified form. It is often developed in a public or collaborative manner. While there are different open source software with different functionalities, this study will focus on open source library software. Open source library software is concerned with the application of open source technologies such as KOHA and NewGenLib in the management of the different library routine activities (Uzomba *et al.*, 2015). Other examples of open source library software include Greenstone Digital Library, DSpace, E-Prints, PhpMyLibrary, OpenBiblio and Avanti,

The term library software encompasses Integrated Library System (ILS) also known as Library Management System (LMS) and software for managing institutional repositories. Library software can

be used to automate the many activities in the library. It is an enterprise resource planning system for a library, used to track items owned, orders made, bills paid, and patrons who have borrowed items in the library (Wikipedia, 2012). This common application is tied together with data residing in common databases (as much as possible) that are related to many different tasks. Muller (2011) stated that “library software are multifunction, adaptable applications that allow libraries to manage, catalog and circulate their materials to patrons” (p.6). However, it is pertinent to state here that not all library software are open source and not all open source software are library software.

Furthermore, many libraries (especially those in developing countries like Nigeria) have come to embrace open source library software because of its seemingly advantage over other software that are not open source. Breeding (2012) noted that one vital reason for the wide range of adoption of open source library software is that it provides computer automation for all aspects of the operation of a library for free. These software products may be organized into modules that address specific functional areas. Standard modules include cataloging for creating bibliographic records that represent works in the library’s collection, circulation that automates tasks related to loaning items to patrons, serials control for managing periodicals and serials, acquisitions to handle the procurement process, online public access catalogue (OPAC) to provide an interface for library users that enables them to locate items in the library’s collections and take advantage of other services offered by the library (Uzomba *et al.*, 2015). Also, Breeding (2004) observed that open source library software automates many library tasks that would otherwise be repetitive, labor intensive, and inefficient. The acquisition and maintenance of an open source library software is a major investment for a library. Though the systems are free, they usually require some budgetary allocations for the hardware requirements and maintenance.

In recent years, open source library software have been the driving force for technological innovations and automation in libraries in Nigeria. This is because the system offers benefits such as adaptability and customization, security and stability, quality and reliability, cooperation and community, freedom and flexibility. Higher Education Library Technology (2019) noted that the use of open source library software offers libraries lower costs, no lock-in, innovation and a richer library systems ecosystem.

Showers (2013) opined that the existence of the open source library software has introduced new developments in libraries such as open (linked) data; managing research data; open scholarship and science; open content such as OERs; crowdsourcing, and, of course, open access. Open source solutions for the library fit very well into this broader open momentum of significantly affecting the academic world positively. However, despite the numerous benefits that open source library software offers to libraries, observations, past literature and preliminary investigations have revealed that the different open source library software in libraries in South-south, Nigeria are grossly underutilized. For instance, many university libraries still engage in manual cataloguing of information materials even when they have a fully functional cataloguing module where they can import the bibliographic details from (such as LC and Columbia library) or request vendors to submit a softcopy of the bibliographic record of materials to be purchased. Also, Ogbeni (2019) reported that many libraries using KOHA software still charge out library materials manually thereby underutilizing the circulation module. The use of serial module for serial control is almost non-existent in some libraries presumably automated with an open source ILS. This further raises questions about the level of use of open source library software in university libraries in South-south, Nigeria. It is on this note that this study was conducted to investigate the use of open source library software in university libraries in South-south, Nigeria

### **Problem Statement**

Development in technology has led to the proliferation of different open source library software. The software offers libraries the opportunity to use state-of-the art technology with minimal cost. Open source library software provide the platform for libraries to automate it services by using Library Management Systems (LMS) such as KOHA and NewGenLib to manage library activities such as registration of library users, charging and discharging, cataloguing, classification and indexing of library materials. Other known open software used in libraries includes Evergreen, Greenstone Digital Library, DSpace and E-Prints.

Sadly, despite the availability of these open source technologies, observation and preliminary investigation have revealed that many libraries in South-South Nigeria are still known for carrying out activities manually. This is in spite of the fact that many libraries have embraced open source

technologies because its openness. More worrisome is the fact that some libraries with open source technologies like KOHA and NewGenLib do not use the technology in the registration of library users, charging and discharging of library materials and cataloguing and classification. This further justifies the need to assess the use of open source library software in university libraries in South-south, Nigeria. It is on this premise that this study was conducted to assess the use of open source library software in university libraries in South-South, Nigeria

The aim and objectives of this study is to identify, examine the level and frequency of use of the various open source library software in university libraries in South-South Nigeria and to determine the factors hindering their effective utilization.

### **Research Questions**

The following research questions guided the study

1. What are the various open source library software used in university libraries in South-South Nigeria and what is their level and frequency of use ?
2. What are the factors hindering the effective utilization of open source library software in the university libraries?

### **LITERATURE REVIEW**

The emergence of new media (internet or digital technologies) changes the way people communicate with each other, access and share information (Okuonghae, 2018). Open source library software provides an effective way to automate library operations without the library undertaking substantial financial investment (Reddy & Kumar, 2013). Since the emergence of such technology, developers have continuously increased the offerings of fast, freely-available ILS software. In the same vein, Breeding (2012) stated that open source library software provide a major alternatives for librarians who work with computer software. Courant and Griffiths (2006) explained that the use of open source library software in libraries can potentially reduce costs of automation and give librarians/users more control and increase software performance.

Some of the more well-known open source library software include Koha, NewGenLib, Greenstone Digital Library, DSpace, E-Prints, PhpMyLibrary, OpenBiblio Avanti, ABCD and Evergreen (Uzomba *et al.*, 2015). In a comprehensive study of 40 ILS by Müller (2011), Koha was found to be the only mature open source ILS, the most complete in terms of functionality, the best quality in terms of implementation features, and with a sustainable community in terms of the number of developers and frequency of releases. Furthermore, Koha offers the most international options in terms of date format, type of MARC record, and language (Müller, 2010, p. 67). In a thorough comparative evaluation, Koha outperformed or matched NewGenLib in many of the aspects evaluated (Singh and Sanaman, 2012) although Müller (2010) earlier rejected NewGenLib in his study for lack of adequate community involvement and support. Macan (2013) found that, although Koha has more functionality, ABCD, which is derived from ISIS, is worth considering by libraries without IT support. In a study comparing Koha and Evergreen with two proprietary ILS, Pruet and Choi (2013) found that both Koha and Evergreen are viable alternatives to major proprietary vendors; these two OS ILS are the most popular in the USA (Singh, 2013).

Among various library software which have found their way into Nigerian market today, Koha has gained more popularity and acceptability in Nigerian libraries, especially academic libraries. For instance, Samuel Adegboyega University, Ogwa which is one of the private universities in the country established by The Apostolic Church (LAWNA Territory), has installed KOHA (Otunla and Akanmu-Adeyemo, 2016). Nnamdi Azikiwe Library, University of Nigeria, Nsukka has successfully integrated their vast information resources into Koha library management. One of the new federal universities in Nigeria established in 2011, Federal University Oye-Ekiti adopted the use of KOHA in its first month of 2013. In the case of Adeyemi College of Education, which was established in 1962, migrating to Koha, the institution was able to purchase equipment and begin installing Koha and manually migrating their data to Koha. Initially, there were some initial problems, such as phobia of the staff in automation, erratic power supplies (which is a very common problem in Nigeria). Today, they are very excited in presenting their story and Koha to other college community members in Nigeria and help them spread and install Koha. According to Redeemers University Library online newsletter (2012), Redeemers

University which is one of the nation's private universities owned by the Redeemed Christian Church, migrates its bibliographic records from the former Portal systems to Koha Integrated Library systems in August, 2011.

### **METHODOLOGY**

The survey type of the descriptive research design was adopted in carrying out this study. This type of research design allowed the researchers to collect data from librarians in order to assess the use of open source library software in universities. The population of this study is 186 librarians in selected universities in South-South Nigeria. Only universities in South-south Nigeria with functioning open source library software were used for this study. At the time the study was conducted, 15 universities in South-south, Nigeria had functioning open source library software, thus, constituting the population for this study. The breakdown of the universities used for this study is presented in Table 1. The study adopted the total population sampling technique. This is because the population is of a manageable size, thus, conforming to Nworgu's (2015) assertion that the entire population of a research study can be adopted if the population is of a manageable size. Therefore, the sample size for this study is 186 respondents. A self-developed questionnaire was used as the instrument for data collection and it was validated by experts in Library and Information Science and Measurements and evaluation. To ensure the reliability of the instrument, a test-retest method of reliability was conducted at the Federal University of Technology, Akure (FUTA) within an interval of two weeks and it yielded a reliability coefficient of 0.80 and was considered adequate for the study. The instrument was administered directly to the respondents by the researchers. The data collected were analyzed using descriptive statistics and the results were presented in Tables.

## RESULTS AND DISCUSSION

**Table 1: Questionnaire Response Rate**

S/N	Names of Universities	No of Librarians	Questionnaire Returned	Response Rate (%)
1.	Akwa-Ibom State University of Technology, Uyo	15	9	60
2.	Ambrose Alli University, Ekpoma	13	12	92
3.	Cross River State University of Science & Technology, Calabar	12	11	92
4.	Edwin Clark University, Kiagbodor, Delta State	3	3	100
5.	Federal University, Otuoke, Bayelsa State	10	8	80
6.	Federal University of Petroleum Resources, Effurun	21	17	81
7.	Igbinedion University, Okada, Edo State	7	7	100
8.	Niger Delta University, Yenagoa, Bayelsa State	11	11	100
9.	River State University of Science & Technology, Port Harcourt; Rivers State	9	8	89
10.	Samuel Adegboyega University, Ogwa; Edo State	5	3	60
11.	Western Delta University, Oghara, Delta State	5	5	100
12.	University of Benin, Benin City; Edo State	16	14	88
13.	University of Calabar, Calabar; Cross River State	25	18	72
14.	University of Port Harcourt, Port Harcourt; River State	19	16	84
15.	University of Uyo, Uyo; Akwa-IbomState	15	15	100
	<b>Total</b>	<b>186</b>	<b>157</b>	<b>84</b>

Table 1 revealed that a total 186 questionnaire were administered to the respondents in the fifteen universities used for this study and a total of 157 questionnaires were retrieved from the respondents indicating a response rate of 84%. This response rate is considered adequate for this study as it is in line with Osuala (2005) that the minimum universally accepted response rate for most research studies which is 60%.

**Table 2: Distribution of Respondents by Demographic Characteristics**

<b>Gender distribution</b>		
<b>Gender</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Male	59	38
Female	98	62
<b>Total</b>	<b>157</b>	<b>100.0</b>
<b>Age distribution</b>		
<b>Age</b>	<b>Frequency</b>	<b>Percentage (%)</b>
20 – 30 years	12	8
31 – 40 years	44	28
41 –50 years	69	44
51- 60 years	22	14
61 years and above	10	6
<b>Total</b>	<b>157</b>	<b>100</b>
<b>Staff Designation</b>		
<b>Staff Designation</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Assistant Librarian	20	13
Librarian II	54	34
Librarian I	41	26
Senior Librarian	21	13
Principal Librarian	12	8
Deputy University Librarian	5	3
University Librarian	4	3
<b>Total</b>	<b>157</b>	<b>100</b>

<b>Working Experience</b>		
<b>Working Experience</b>	<b>Frequency</b>	<b>Percentage (%)</b>
1-5years	28	18
6-10 years	51	32
11-15 years	37	24
16-20 years	31	20
21-25 years	7	4
26 years and above	3	2
<b>Total</b>	<b>157</b>	<b>100</b>

Table 2 revealed that 38% of the respondents are male while 62% of the respondents are female, therefore implying that there are more female librarians than their male counterparts in university libraries in South-South Nigeria.

Also, Table 2 revealed that 44% of the respondents are within the age range of 41-50 years, 28% are within the age range of 31-40 years, 14% are within the age range of 51-60 years, 8% are within the age range of 20-30 years, while only 6% are with the age range of 61 years and above. This implies that majority of the respondents are within the age range of 31-50 years.

Furthermore, Table 2 revealed that while 34% of the respondents are librarian II, 26% are librarian I while 13% are assistant librarian and senior librarian respectively. Also, the Table revealed that 8% of the respondents are principal librarian while 3% are deputy university librarian and university librarian respectively. This implies that there are more respondents in librarian I and librarian II designation than in any other designation in the university libraries in South-South, Nigeria.

Table 2 also revealed the working experience of the respondents as 32% of the respondents indicated that they have within 6-10 years of working experience, 24% have 11-15 years of working experience, 20% have within 16-20 years of working experience, while only 2% of the respondents indicated that they have 26 years and above working experience. This implies that majority of the respondents have within 6-20 years of working experience.



**Table 3: Various Open Source Library Software Used in University Libraries**

Open Source Library Software	Agree		Disagree		Total
	No.	%	No.	%	
KOHA	121	77.1	36	22.9	157
NewGenLib	94	60	63	40	157
Evergreen	79	50.3	78	49.7	157
Greenstone	18	11.5	139	88.5	157
DSpace	88	56.1	69	43.9	157
EPrints	36	23	121	77	157
Fedora	10	6	147	94	157

Table 3 shows that 77.1% of the respondents agreed that KOHA is used in university libraries in South-South Nigeria. 60% use NewGenLib, 56.1% use DSpace while 50.3% agreed to the use of Evergreen. Also, 94% of the respondents disagreed that they use Fedora, 88.5% disagreed to the use of Greenstone while 77% of the respondents also disagreed that they use EPrints. This implies that the various open source library software used in university libraries in South-South Nigeria are KOHA, NewGenLib, DSpace, and Evergreen. The result also indicate that KOHA and NewGenLib are the two most used open source library software in university libraries in South-south, Nigeria.

**Table 4: Level of Use of Open Source Library Software in the University Libraries**

Use of Open Source Library Software	Very High		High		Low		Very Low		Mean (x̄)
	No.	%	No.	%	No.	%	No.	%	
use of open source library software to search for books and library materials	140	89.2	10	6.4	2	1.2	5	3.2	3.82
use of open source library software to do cataloguing and classification of books	103	65.6	44	28.0	7	4.5	3	1.9	3.57
use of open source library software to order for books and library materials	24	15.3	78	49.7	16	10.2	39	24.8	2.55
Use of open source library software to charge & discharge books and library materials to users	103	65.6	44	28.0	7	4.5	3	1.9	3.57
Use of open source library software to register users or patrons	91	58.0	32	20.4	14	8.9	20	12.7	3.24
Use of open source library software to access Web based OPAC system	103	65.6	44	28.0	7	4.5	3	1.9	3.57
Use of open source library software to print barcodes	15	9.6	41	26.1	96	61.1	5	3.2	2.42
Use of open source library software for library stock management	91	58.0	32	20.4	14	8.9	20	12.7	3.24
Use of open source library software to E-mail and/or text patron's overdue and other notices	13	8.3	35	22.3	79	50.3	30	19.1	2.20
<b>Grand Mean</b>									<b>3.13</b>
<b>Criterion Mean</b>									<b>2.50</b>

Table 4 revealed the level of use of open source library software in the university libraries. The table revealed level of use of open source library software books and library materials search (89.2%), cataloguing and classification of books (65.6%), charging & discharging of library materials to users (65.6%), Web based OPAC system access (65.6%), registration of library users or patrons (58%) and library stock management (58%) is very high. The table also revealed a grand mean of 3.13 which is higher than the criterion mean of 2.50, thus, implying that the level of use of open source library software in the university libraries is very high.

**Table 5: Frequency of Use of Open Source Library Software in the University Libraries**

Use of Open Source Library Software	Daily		Weekly		Occasionally		Never		Mean ( $\bar{x}$ )
	No.	%	No.	%	No.	%	No.	%	
use of open source library software to search for books and library materials	139	88.5	7	4.5	6	3.8	5	3.2	3.78
use of open source library software to do cataloguing and classification of books	91	58.0	32	20.4	14	8.9	20	12.7	3.24
use of open source library software to order for books and library materials	7	4.5	44	28.0	103	65.6	3	1.9	2.35
Use of open source library software to charge & discharge books and library materials to users	140	89.2	10	6.4	2	1.2	5	3.2	3.82
Use of open source library software to register users or patrons	144	91.7	6	3.8	4	2.5	3	1.9	3.85
Use of open source library software to access Web based OPAC system	103	65.6	44	28.0	7	4.5	3	1.9	3.57
Use of open source library software to print barcodes	16	10.2	24	15.3	78	49.7	39	24.8	2.11
Use of open source library software for library stock management	107	68.2	41	26.1	4	2.5	5	3.2	3.59
Use of open source library software to E-mail and/or text patron's overdue and other notices	22	14.0	14	8.9	47	30	74	47.1	1.90
<b>Grand Mean</b>									<b>3.13</b>
<b>Criterion Mean</b>									<b>2.50</b>

Table 5 revealed the frequency of use of open source library software in the university libraries. The table shows that open source library software are used on daily basis to register users or patrons (91.7%), charge & discharge books and library materials to users (89.2%), search for books and library materials (88.5%), undertake library stock management (68.2%), access Web based OPAC system (65.6%), and to do cataloguing and classification of books (58%). Furthermore, 65.5% of the respondents indicated that they occasionally use open source library software to order for books and library materials. It is

also worthy of note that 47% of the respondents have never used open source library software to E-mail and/or text patron's overdue and other notices. Furthermore, the table shows a calculated grand mean of 3.13 which is higher than the criterion mean of 2.5, thus implying that open source library software in the university libraries is frequently used for different library routine in university libraries in South-south Nigeria. This implies that open source library software are frequently used in university libraries in South-south, Nigeria.

**Table 6: Factors Hindering the Effective Utilization of Open Source Library Software in the University Libraries**

Factors Hindering the Effective Utilization of Open Source Library Software	Agree		Disagree		Total
	No.	%	No.	%	
Insufficient manpower	121	77.1	36	22.9	157
Lack of supervision	119	75.8	38	24.2	157
Inadequate managerial support	79	50.3	78	49.7	157
Inadequate power supply	139	88.5	18	11.5	157
Cost of Procurement of the hardware/software	88	56.1	69	43.9	157
Maintenance Cost	111	70.7	46	29.3	157
Vendor's insincerity	80	51.0	77	49.0	157
Lack of Consortium	38	24	119	75.8	157
Apathy on the part of Library Staff	139	88.5	18	11.5	157
Lack of training and re-training of staff	104	66.2	53	33.8	157
Lack of technical knowledge from the Staff	119	75.8	38	24.2	157

Table 6 revealed that inadequate power supply (88.5%), apathy on the part of library staff (88.5%), insufficient manpower (77.1%), lack of supervision (75.8%), lack of technical knowledge from the staff (75.8%), maintenance cost (70.7%), lack of training and re-training of staff (66.2%), cost of procurement of the hardware/software (56.1%) and inadequate managerial support (50.3%) are the factors hindering the effective utilization of open source library software in the university libraries as agreed by the respondents. This implies that the factors hindering the effective utilization of open source library software in the university libraries in South-South Nigeria include inadequate power supply, apathy on the part of library staff, insufficient manpower, lack of supervision, lack of technical knowledge from the staff, maintenance cost, lack of training and re-training of staff, cost of procurement of the hardware/software and inadequate managerial support.

Research question one revealed that the various open source library software used in university libraries in South-South Nigeria include KOHA, NewGenLib, DSpace, and Evergreen. This finding supports Ukachi *et al.* (2014) assertion that libraries in Nigeria use different open source library software in

automating their routine activities. The study also revealed that among the different open source library software in use in university libraries in South-south, Nigeria, KOHA and NewGenLib are the most widely used software. This revelation is in tandem with Uzomba, Oyebola and Izuchukwu (2015), Reddy and Kumar (2013) and Breeding (2012) that most libraries in now subscribe to the use of KOHA and NewGenLib in performing some key library routine functions because of the flexibility, functionalities and updating capability of the software. From KOHA for instance, is widely used in many libraries in Africa because it is an open source and it has the capability to automate the key routine activities in the library.

Research question two revealed that the level of use of open source library software in the university libraries is very high as different library activities in the library are carried out using open source library software. This finding corroborates the assertion of Ukachi (2012) that librarians in academic libraries now prefer the use of open source library software in carrying out their daily routine task due to the advantages associated with its use. This revelation also support the opinion of Ibrahim (2015) who stated that open source library software have gained more usability, stability and acceptability in academic libraries in recent years, thus, leading to high level of usage by both library staff and users of academic libraries in Nigeria. Conversely, this finding contradicts Omeluzor (2012) assertion that many libraries in Nigeria still perform the library routine functions manually and only 37% of the libraries actually have fully functioning open source library software. The reason for the contradiction could be attributed to the time gap from which Omeluzor's study was conducted and the time this present study was conducted.

Open source library software in the university libraries is frequently used for different library routine. This finding is in conformity with Ukachi (2012) that librarians in academic libraries now use open source ILS frequently in carrying out their daily routine task due to the advantages associated with its use. Furthermore, the finding is in agreement with Samuel and Griffy's (2014) assertion that librarians and library users use open source ILS on daily basis due to the functionality and dynamic nature of open source ILS such as KOHA and NewGenLib. Patrons and library staff consult the open source ILS when

searching for information material in the library, when charging and discharging, as well as when registering library users.

The factors hindering the effective utilization of open source library software in the university libraries in South-South Nigeria include inadequate power supply, apathy on the part of library staff, insufficient manpower, lack of supervision, lack of technical knowledge from the staff, maintenance cost, lack of training and re-training of staff, cost of procurement of the hardware/software and inadequate managerial support. This finding is in conformity with Okewale and Adetimirin's (2011) assertion that the use of open source library software and other technologies in the library is faced with numerous challenges such as epileptic power supply, lack of technical knowledge among library staff apathy on the part of the library staff and management. Also, the finding is in tandem with Oyelude (2016) that maintenance cost, lack of training and re-training of staff, cost of procurement of the hardware/software and inadequate managerial support are factors affecting the effective utilization of open source library software in university libraries in Nigeria. With these factors, it will be very difficult for any of these libraries to effectively utilize open source library software or other ICT infrastructures. However, past literatures have revealed that these challenges are perennial challenges facing the use of technologies in libraries in Africa. Thus, explaining the reason for the relatively low level of adoption and use of digital technologies in the continent.

### **CONCLUSION AND RECOMMENDATIONS**

It is very important for libraries to use open source library software regularly if they are to render improved and efficient services. Apart from the fact that it requires little to operate, open source library software is very reliable, effective and saves time. Open source library software offers libraries the opportunity to automate its routine tasks. Today, open source library software has gained more acceptability and usability from among different libraries in Nigeria, the most popular among them being KOHA Integrated Library System and NewGenLib. The open source library software is highly in use because of its unique features such as union catalog facility, full acquisitions system, Serials system for magazines or newspapers among others, customizable search, Web 2.0 facilities like tagging,

comment, social sharing and RSS feeds, circulation and borrower management, simple acquisitions system for the smaller library, ability to cope with any number of branches, patron categories, item categories, currencies and other data. It is therefore very important for libraries to effectively and fully utilize the open source library software so that they can deliver effective and enhanced services.

Based on the findings from this study, the following recommendations were made:

1. University libraries in South-south Nigeria should take advantage of other open source library software to improve and provide newer services. Apart from library management system software, there are other open source software which could be used for managing institutional repositories or carry out other functions. Software such as Greenstone Digital Library Software, Drupal, EPrints and Fedora all have unique functionalities which could be useful to libraries.
2. Training and re-training should be organized periodically for both library staff and library users so as to improve usage of the system.
3. University management should budget adequately for both the procurement and maintenance of hardware/software needed for the effective utilization of open source library software in the library. The issue of maintenance and updating of the software must be adequately budgeted.
4. A backup power supply such as inverter and/or standby generating set should be in place in the event of power failure.

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