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Staff Use and Satisfaction with Open Source Software in the Management of Selected Federal Universities' Libraries in South Nigeria

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ABSTRACT

Aim of the Study: Libraries are the key source of knowledge and information in the educational setups especially in universities. The aim of the current study to explore the use and satisfaction of open source software by university library workers in Nigeria.

Methodology: The study was conducted using a survey-type descriptive research design. The study's sample size was (N=203), which represented every member of the library staff at the chosen university libraries as a whole. The "*Library Staff Use and Satisfaction with Open Source Software Questionnaire (LSUSOSSQ)*" was used as the instrument for data collection and the census sample technique was used for the study. By employing the test-retest procedure and the Pearson Product Moment Correlation Coefficient (r), which produced a reliability coefficient of 0.84, the instrument's reliability was increased. From the whole population of 203, in return 195 copies of the questionnaire were received and noted 96.1% return rate. To address the study issues, data were examined using descriptive statistics like mean and standard deviation, and the t-test to evaluate the hypotheses at a significance level of 0.05.

Findings & Conclusion: The study found that university libraries in South-South Nigeria used the administration, cataloguing, and circulation modules of OSS extensively and had high levels of satisfaction with their use. The study suggested using OSS in university libraries in Nigeria to facilitate teaching and research, which will also increase the visibility of Nigerian academics in the committee of scholars across the world.

Keywords: Open Source Software, University Libraries, Staff Satisfaction.

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Introduction

Access to information is core in human and organizational endeavours because individuals and managers need information for effective and efficient decision making. Hence, universities that engage in the training of high-level manpower must equip the trainee for high performance at workplace upon graduation. To this end, university libraries acquire, process, organize and disseminate the required

information resources to meet the information needs of the teaming students' population for future purposes. However, the plethora of information and knowledge at the disposal of man and in organizations, fostered by modern technologies has made the concept of access to information complex. Therefore, librarians are compelled to device means of ensuring that students and researchers have access to useful information resources in the cause of managing libraries. One of such is the adoption of the open source library management software for effective and efficient library services.

An integrated library management system, known as Open Source Software (OSS), is used to manage libraries. It was made available through the Open Source Initiative (OSI), which grants a wide range of usage, modification, and distribution rights. According to Iwundu (2012), an open source piece of software is one that can be downloaded for free from the internet and used as long as there is an internet connection. Since the source code for OSS is open source and flexible to edit, users are able to not only contribute to its continued development and bug fixes, but also to operate and distribute the software without any limitations thanks to the licence. This is against the proprietary software that is expensive and cannot be easily manipulated. Hence, libraries globally are embracing the OSS for daily operations and library services management, thereby providing means for efficient service delivery. The creation of OSS in the world today has facilitated the dynamic world of technological library services (Ukachi, 2012).

The Open Source Software (OSS) paved ways for libraries in developing countries to compete with libraries in the western world, having incorporated manually-tasking modules such as administration, cataloguing, circulation and many others into the software programme. OSS is a technological package developed by software technologist with the key or symbols and the right to ownership of the packages given to the users with the access to redevelop it to personal expectations. Abdulraheem, Usman, and Iyun (2008) claim that open source software is created through a transparent distributed peer review process and promises greater quality, higher reliability, more flexibility, and cheaper costs than vendor-driven applications. This is due to its affordable prices—there are no setup fees, licencing fees, or upgrade fees. It usually isn't dependent on specialised hardware, which lowers the cost of the hardware.

The use of computer systems in the university library has improved library service delivery, particularly with the use of OSS that facilitates the automation of libraries. The KOHA ILS, Greenstone, Evergreen, NewGenLib, Dspace, and EPrints (repository software) were mentioned by Randhawa (2016) as some of the OSS that can be used in libraries. The KOHA ILS is one of these that has been widely utilised. These OSS have mandated that librarians must conduct automated library tasks as opposed to those that are now performed manually, such as administration, serials control, cataloguing, and circulation tasks. As such, training for library staff to acquire the needed skills and competencies for the utilization of the library software to enhance optimal service delivery is inevitable. This training will facilitate librarian's use of the software and possibly bring about competence and satisfaction in their professional practice.

Library staff's satisfaction with the utilization of the open source software becomes paramount for an automated library system. The use of the software by library staff to navigate the various library modules would assist in performing library routines quicker and more efficiently. Therefore, the ease of use is a factor of staff satisfaction with the modules, which in turn makes for maximal service delivery. According to Sarma (2016), the OSS contains the following modules; administration, acquisition, serial management, selective dissemination of information (SDI) Service, and many more.

The administration component of library system manages the automated system's housekeeping tasks. The purchase of materials, technical processing including categorization and cataloguing, circulation management, serials control, inter-library loan (ILL), etc. are all included in Sarma's (2016) definition of housekeeping activities. Online Public Access Catalogue (OPAC), suggestions for where to buy books, and other public services are examples. In order to define access to any portion of the various modules and associated databases, Dhamdhere (2016) claims that the administrative module of the OSS provides for the specification of user's profiles and the assignment of users to them.

Another crucial aspect of OSS is the circulation module. According to Chattopadhyay and Makhopadhyay (2016), a series of actions that are specialised, repeatable, and systematic make up circulation labour in a library. A minimal set of necessary data is needed by circulation systems through OSS to perform circulation tasks. Systems for navigating information about the lender, information about the resources to be lent out, and the terms for lending make up circulation systems. It's important to note that the module's capacity to carry out the circulation procedures necessitates the employment of software. Therefore, a decent library management system should have a circulation system that includes user registration, status maintenance, knowledge of the status of library titles, database maintenance, inter-library lending, fine collection from defaulters, and online searches.

Cataloguing and classification been the core of library operations should be adequately considered. There should be a robust cataloguing and classification module in every library automated system, be it open source or proprietary (fee-based). The cataloguing module of library automation software must meet the universally acceptable MARC (Machine Readable Cataloguing) standard for cataloguing. Thus, Macan, Fernández, and Stojanovski (2013) noted that KOHA ILS supports MARC21 and UNIMARC, two widely used information formats (Universal Machine Readable Cataloguing). Similar to MARC21, Dublin Core, METS (Metadata Encoding and Transmission Standard), and other current standards, ABCD (Automation des Bibliothèques et Centres de Documentacion) is also compatible, but it is actually independent of formats, allowing libraries to implement any metadata standard or their own metadata schema (Macan, Fernández, & Stojanovski, 2013).

The ability to manage various bibliographic structures is a highly helpful feature, particularly for libraries that do not adhere to a unified metadata standard. MARC bibliographic frameworks must be made available by the cataloguing and categorization module for copy cataloguing with the Z39.50/SRU search protocol as well as original cataloguing. A strong cataloguing module should open the door to an OPAC bibliographic record that is properly organised (Online Public Access Catalogue). The OSS's OPAC helps users access online resources and conduct library holdings searches. The module's main responsibilities are to assess how well users can locate information, check the details and status of any given item, log users in, propose books, place books on hold, and do other similar tasks related to the OPAC functionality.

With these modules among others, library staff could execute library services easier and faster to meet user’s information needs. Therefore, the level of use of OSS modules in university libraries has become imperative since it goes a long way in determining acceptability and adaptability of the software in libraries to efficiently meet user’s information needs thereby resulting in satisfaction. Hence, this study investigated the open source software in the management of university libraries with focus on staff use and satisfaction of the software in achieving library goals.

Statement of the Problem

The main goal of universities is teaching/learning, research and community services; and university libraries facilitate the process. However, the penetrating force of information and communication technologies (ICTs), in the use of OSS in library operations has influenced the services provided by library staff. Despite the numerous benefits associated with an automated library services and service delivery, it is disheartening to note that most university library staff finds it difficult or seem to lack the requisite skills and competencies in functioning in the digital environment. Hence, library staffers are not effectively and efficiently utilizing the digital provisions to facilitate their services, leading to slow library operations and service delivery to users. Therefore, this study investigated the use of OSS in the management of university libraries with focus on library staff satisfaction.

Purpose of the Study

This study examined the use and satisfaction of library staff with OSS in the management of university libraries. The specific objectives are to:

i. find out the level of use of the administrative module of OSS by staff in the management of university libraries;

ii. examine the level of use of the cataloguing module of OSS by staff in the management of university libraries;

iii. know the level of use of the circulation module of OSS by staff in the management of university libraries;

iv. determine the extent to which library staff are satisfied with the use of these OSS modules in the management of university libraries;

Research Questions

The following research questions will be answered in the study;

i. What is the level of use of the administrative module of OSS by staff in the management of university libraries?

ii. What is the level of use of the cataloguing module of OSS by staff in the management of university libraries?

iii. What is the level of use of the circulation module of OSS by staff in the management of university libraries?

iv. To what extent is library staff satisfied with the use of these OSS modules in the management of university libraries?

Research Hypotheses

The following research hypotheses will be tested in the study at 0.05 level of significance:

H1: There is no significant difference between the mean ratings of male and female library staff on the level of use of the administrative module of OSS for the management of university libraries.

H2: There is no significant difference between the mean ratings of male and female library staff on the level of use of the cataloguing module of OSS for the management of university libraries.

H3: There is no significant difference between the mean ratings of male and female library staff on the level of use of the circulation module of OSS for the management of university libraries.

H4: There is no significant difference between the mean rating of male and female library staff on the extent to which they are satisfied with the use of these modules for the management of university libraries.

Research Methods

Research Design

The study examined library staff use and satisfaction with open source software in the management of university libraries. The descriptive survey research design was employed in the study to describe and interpret existing conditions and practices.

Population & Sample

The population of the study is two hundred and three (203) comprising all library staff in three (3) selected federal university libraries in South-south Nigeria. The university libraries selected was based on

the fact that they are already making use of OSS in the libraries. They are the University of Benin, Benin City (75); University of Uyo, Uyo (68) and University of Calabar, Calabar (60).

Sampling Technique

The census sampling technique was used because of the nature of the small population size of library staff and number of university libraries making use of OSS at the time of this study.

Data Collection Tool

The sole instrument for data collection in this study is the questionnaire, tagged "Library Staff Use and Satisfaction with OSS Questionnaire (LSUSOSSQ)" and made up of two (2) sections. Section 1 contains the personal data of the respondents while Section 2 is made up of 3 parts in 8 clusters. It includes open-ended questions about the Library Staff Level of Use of the Administration, Cataloguing, and Circulation Modules of OSS and statements about the Library Staff Satisfaction with the Design of the Administration, Cataloguing, and Circulation Modules of OSS.

Data Analysis Technique

The study's data were analyzed using descriptive statistics (mean and standard deviation) in order to respond to the research questions and inferential statistics (t-Test) in order to test the null hypothesis at 0.05 level of significance with a criterion mean of 2.50, where any item above this was accepted and any item below this was rejected. Statistical Package for Social Sciences (SPSS) software was used for all statistical analyses, and the demographic variable of gender was used.

Results and Discussion of Findings

The researcher administered 203 copies of the questionnaire and 195 copies were duly completed and returned, representing 96.1% return rate, which were used for the study. The results are hereby presented below.

Library Staff Use of the Administrative Module of OSS in the Management of University Libraries

On the Level of Use of the Administrative Module of OSS by library staff in the management of university libraries, Table 1 was used to answer the research question.

Table 1: *Mean Responses of Library Staff on the Level of Use of the Administrative Module of OSS (n = 195)*

SN	Administration module of OSS is used for:	VHU	HU	LU	VLU	$\bar{X}$	σ	Rmk
1.	OPAC Configuration	144	47	3	1	3.71	.51	VHU
2.	MARC Bibliographic Framework	154	38	2	1	3.76	.47	VHU
3.	Setting Basic Parameters	138	55	2	-	3.69	.48	VHU
4.	Patrons and Circulation Control	138	53	2	2	3.67	.54	VHU
5.	Setting Acquisition Parameters	99	84	12	-	3.44	.60	HU
6.	Adding Z39.50 Search Targets	87	92	15	1	3.35	.64	HU
7.	System Upgrade	70	115	7	3	3.29	.61	HU
8.	Managing Plug-in	76	105	14	-	3.31	.60	HU
9.	Managing the Reports Module	79	100	11	5	3.29	.69	HU
10.	System Backup/File	95	74	19	7	3.31	.79	HU
	Cluster mean					**3.48**	**.59**	**HU**

Note: $\bar{X}$ = Mean, σ = Standard Deviation of the Population, VHU= Very High Use, HU = High Use, LU=Low Use, VLU=Very Low Use, n = number of respondents, Rmk = Remark.

According to the data in Table 1, the cluster mean rating for the ten items was 3.48, and the cluster standard deviation was 0.59, both of which fall within the actual range of 2.50-3.49. This shows that the

management of university libraries by library staff makes extensive use of the administrative module (OPAC configuration, MARC bibliographic framework, setting basic parameters, patrons and circulation control, adding Z39.50 search targets, managing plug-in, managing the reports module, system backup/file, etc.) of OSS. Similar to that, Table 2 displays the t-test outcome for the hypothesis.

Table 2: *The t – Test Analysis of the Mean Responses of Male and Female Library Staff on the Level of Use of the Administrative Module of OSS in University Libraries*

Group	N	X	Σ	df	t-cal	Sig. (p-value)	Remark
Male Library Staff	102	3.52	.60	193	.77	.53	NS
Female Library Staff	93	3.46	.58				

N = Number of respondents, X = Mean of respondents, σ = Standard deviation of a population, df = degree of freedom (193), t-cal= t-calculated, sig. (p-value)= significant at $p<0.05$, NS = Not significant.

There is no statistically significant difference in the mean ratings of the in Table 2 above, where the p-value is 0.53 and is higher than the alpha-value of 0.05. As a result, it is agreed that there is no difference in the mean replies of male and female library employees with regard to their use of the administrative module of OSS. This hypothesis was supported by the p-value of 0.05.

The conclusion of this study is revealed by ProjektLink Konsult Limited's (2010) assertion that Koha, the first open-source integrated library system (ILS) used by public school and special libraries worldwide, is acceptable to a growing community of libraries and users working together to achieve their technological goal. According to Adekanye (2011), the administrative module of the library software manages the management information system for the entire organisation, ensuring the ongoing development of new applications, maintenance of the database, and technical support for the programme. Users no longer have to physically visit the library in order to view the library's collections thanks to local area networking. Uzomba, Oluwatofunmi and Izuchukwu (2015) acknowledge many kinds of OSS solutions that have facilitated library operations.

Library Staff Level of Use of the Cataloguing Module of OSS in University Libraries

On the level of use of the cataloguing module of OSS by library staff, the data presented in Table 3 was used to answer the research question.

Table 3: *Mean Responses of Library Staff on the Level of Use of the Cataloguing Module of OSS in University Libraries (n = 195)*

SN	Cataloguing Module of OSS is used for:	VHU	HU	LU	VLU	$\bar{X}$	Σ	Rmk
1.	Adding new records	88	84	20	3	3.31	.71	HU
2.	Adding Search Targets	102	77	6	10	3.38	.78	HU
3.	Choosing Item Types	90	81	16	8	3.29	.58	HU
4.	Creating Metadata	77	96	15	7	3.24	.74	HU
5.	Z39.50 Search (Copy Cataloguing)	84	84	10	17	3.20	.89	VHU
6.	Creating Alternative Search	117	71	5	2	3.55	.60	VHU
7.	Importing Z39.50 Record	121	66	7	1	3.57	.59	VHU
8.	Itemization	107	82	5	1	3.51	.57	VHU
9.	Editing Records	98	90	5	2	3.45	.60	HU
10.	Saving	78	94	21	2	3.27	.69	HU
	Cluster mean					**3.38**	**.68**	**HU**

Note: $\bar{X}$ = Mean, σ = Standard Deviation of a population, VHU= Very High Use, HU = High Use, , LU=Low Use, VLU=Very Low Use, n = number of respondents, Rmk = Remark.

The cluster mean response for the 10 items, as determined by the data in Table 3, is 3.38, and the cluster standard deviation is 0.68. This shows that personnel at university libraries heavily utilise the OSS cataloguing module (adding new records, adding search targets, producing metadata, Z39.50 search through copy cataloguing, changing records, saving, etc.). In a similar spirit, Table 4 presents the t-test outcome for evaluating the hypothesis.

Table 4: *The t – Test Analysis of the Mean Responses of Male and Female Library Staff on the Level of Use of the Cataloguing Module of OSS in University Libraries*

Group	N	X	*S*	df	t-cal	Sig. (p-value)	Remark
Male Library Staff	102	3.42	.70	193	.76	.52	NS
Female Library Staff	93	3.34	.69				

N = Number of respondents, X = Mean of respondents, σ = Standard deviation of a population, df = degree of freedom (193), t-cal= t-calculated, sig. (p-value) = significant at p<.05, NS = Not significant.

Table 4 above shows a p-value of 0.52, which is greater than the alpha-value of 0.05 indicating that there is no significant difference between the mean responses of male and female library staff on the high use of the cataloguing module of OSS in the management of university libraries. Therefore, the hypothesis is hereby accepted.

The results show that staff members at university libraries use the cataloguing module of OSS very frequently for tasks like adding new records, adding search targets, selecting item types, creating metadata, performing Z39.50 searches (copy cataloguing), developing alternative searches, importing Z39.50 records, itemising, editing, keeping records, and saving. The results of this study are corroborated by those of Bello (2013) and Amune (2014), which showed that the OSS cataloguing module is actually very effective and that library employees are very happy with the software's cataloguing features. The results of this study are also supported by those of Okewale and Adetimirin (2011), who discovered that among library employees, the cataloguing module was used the most frequently in confirmation of Uwaifo's (2008) exertion that classification was the key library routine to which computer was applied in Nigerian universities.

According to Akinbobola and Adeleke's (2013) research, Koha software can effectively and efficiently meet the needs of library staff and conforms to their requirements. Additionally, library staff members are capable of using computers effectively and are confident in their ability to do so. The current study's findings also aligned with those of Ukachi (2012), who claimed that the emergence and growth of OSS in the modern era made it possible to move from "traditional" to "technology-based" library services, creating space for more effective service delivery, simple access, and affordable services. So, libraries incorporated it into their cataloguing, technological services, digitalization procedures, and overall management of their collections. In an investigation into automated cataloguing procedures and job satisfaction in academic libraries, Bello (2013) discovered that respondents typically distributed work among other catalogers. Sixty-one percent (61%) of respondents use Koha OSS to categorise and classify items on average for three to six hours each day. According to a study by Amune (2014), female librarians in public university libraries utilised OSS more frequently and reported higher levels of job satisfaction than their male counterparts. These differences in use and satisfaction are substantial.

Library Staff Level of Use of the Circulation Module of OSS in University Libraries

On the level of use of the circulation module of OSS by staff in the management of university libraries, data presented in Table 5 was used to answer the research question.

Table 5: *Mean Responses of Library Staff on the Level of Use of the Circulation Module of OSS in University Libraries (n = 195)*

SN	Circulation Module of OSS is used for:	VHU	HU	LU	VLU	$\bar{X}$	σ	Rmk
1.	User Registration	91	74	17	13	3.24	.87	HU
2.	Checking-out Items	150	44	1	-	3.76	.70	VHU
3.	Checking-in Items	135	59	1	-	3.68	.49	VHU
4.	Reserving Items (placing items on hold)	94	93	8	-	3.44	.57	HU
5.	Purchase suggestions	79	107	6	3	3.34	0.61	HU
6.	Default Fine Recording	94	92	9	-	3.43	.58	HU
7.	Sending and Receiving Messages	100	92	3	-	3.49	.53	HU
8.	Changing Password	89	95	7	4	3.37	.65	HU
9.	My Summary	95	90	7	3	3.42	.64	HU
10.	My List	100	90	5	-	3.48	.55	HU
11.	Saving	104	82	9	-	3.48	.58	HU
12.	My Favourite	86	96	13	-	3.37	.60	HU
	Cluster mean					**3.46**	**.61**	**HU**

Note: $\bar{X}$ = Mean, σ = Standard Deviation of a population, VHU= Very High Use, HU = High Use, LU=Low Use, VLU=Very Low Use, n = number of respondents, Rmk = Remark.

The data in Table 5 demonstrate a cluster mean of 0.46 and a cluster standard deviation of 0.61, indicating high usage of the circulation module (user registration, checking-in/checking-out items, reserving items/placing items on hold, default fine recording, sending and receiving messages, changing password, etc.) of OSS by staff managing university libraries. The outcome confirmed the testing of the hypothesis provided in Table 6.

Table 6: *The t – Test Analysis of the Mean Responses of Male and Female Library Staff on the Level of Use of the Circulation Module of OSS in University Libraries*

Group	N	X	*S*	Df	t-cal	Sig. (p-value)	Remark
Male Library Staff	102	3.46	.59	193	.74	.52	NS
Female Library Staff	93	3.46	.58				

N = Number of respondents, X = Mean of respondents, σ = Standard deviation of a population, df = degree of freedom (193), t-cal= t-calculated, sig. (p-value) = significant at p<.05, NS = Not significant.

Table 6 above shows a p-value of 0.52, which is greater than the alpha-value of 0.05. This indicates that there is no significant difference between the mean responses of male and female library staff on the high use of the circulation module of OSS. Therefore, the hypothesis is accepted.

The results regarding the tier of use of the OSS circulation module by library staff in university libraries revealed high usage in user registration, item checkout, item return, item reservation / hold placement, item purchase suggestion, item default fine recording, message sending and receiving, item change, etc. The results are in line with those of Slideshare (2013), which noted that the circulation system tracks material borrowing and returns, the creation of notices like holds and past-due loans, and the calculation of any fines or fees owed. Advanced features of a circulation system include the ability to recognise and trap reserved items when returned, prepare (and send) overdue and recall notices, keep records of items on loan to specific patrons and notify over borrowing, allow for renewals, and facilitate fine payments. These basic functions of a circulation system ensure its continuous use.

Extent of Library Staff's Satisfaction with the Use of the Administrative Module of OSS in University Libraries

On the extent of library staff's satisfaction with the use of the administrative module of OSS in the management of university libraries, the data presented in Table 7 was used to answer the research question.

Table 7: *Mean Responses of Library Staff on the Extent to which they are Satisfied with the Use of the Administrative Module of OSS in University Libraries (n = 195)*

SN	I am satisfied using the Administration module of OSS for	VHE	HE	LE	VLE	$\bar{X}$	σ	Rmk
1.	OPAC Configuration	91	83	17	4	3.33	.72	HE
2.	MARC Bibliographic Framework	84	94	16	1	3.53	.84	VHE
3.	Setting Basic Parameters	100	82	12	1	3.44	.63	HE
4.	Patrons and Circulation Control	18	58	109	10	2.43	.73	LE
5.	Setting Acquisition Parameters	79	85	20	11	3.18	.83	HE
6.	Adding Z39.50 Search Targets	73	102	16	4	3.25	.69	HE
7.	System Upgrade	121	62	8	2	3.53	.67	VHE
8.	Managing Plug-in	105	78	8	4	3.45	.57	HE
9.	Managing the Reports Module	109	76	7	3	3.50	.64	VHE
10.	System Backup/File	70	116	8	1	3.60	.57	VHE
	Cluster mean					**3.32**	**.69**	**HE**

Note: $\bar{X}$ = Mean, σ = Standard Deviation of a population, VHU= Very High Extent, HE = High Extent, LE=Low Extent, VLE=Very Low Extent, n = number of respondents, Rmk = Remark.

From the data presented in Table 7, the cluster mean response is 3.32 and cluster standard deviation is 0.69 respectively. This shows that there is high extent of satisfaction by library staff in the use of the administrative module of OSS in the management of university libraries. Also, the result of the t-test for the hypothesis is shown in Table 8.

Table 8: *The t – Test Analysis of the Mean Responses of Male and Female Library Staff on the extent to which they are Satisfied with the Use of the Administrative Module of OSS in University Libraries*

Group	N	X	*S*	df	t-cal	Sig. (p-value)	Remark
Male Library Staff	102	3.32	.66	193	.98	.46	NS
Female Library Staff	93	3.23	.69				

N = Number of respondents, X = Mean of respondents, σ = Standard deviation of a population, df = degree of freedom (193), t-cal= t-calculated, sig. (p-value) = significant at p<.05, NS = Not significant.

A p-value of 0.46, which is higher than the alpha-value of 0.05, is shown in Table 8. This suggests that there is no appreciable difference in the mean replies of male and female library employees on how highly happy they are with the use of the administrative module of OSS. As a result, the hypothesis is approved here.

According to the study's findings, university libraries' staff members are highly satisfied with the administrative module of OSS's use in terms of OPAC configuration, MARC bibliographic framework, setting basic parameters, setting acquisition parameters, adding Z39.50 search targets, system upgrade, managing plug-in, managing the reports module, and system backup/file management. The results of the current study also agreed with those of Bhavsar (2012), who polled Indian librarians to determine the level of user satisfaction with Koha, which was found to be high in the administrative module. Although the results of Mukhopadhyay (2016) provided a clearer picture of the evolution of library management systems over time and the emergence of open source (OSS) solutions for library management as

alternatives to closed commercial products, they also revealed that staff members were dissatisfied with the functionalities and that the administrative module was used more frequently than other modules.

The results of this study, however, were consistent with those of Albee and Chen (2014), who looked at public library staff attitudes towards an open-source library automation system in the State of Indiana, USA, and discovered that the majority of librarians using the administrative module were happy with the features. The results of this study concurred with those of Vimal and Jasimudeen (2012), who discovered that a number of Koha ILS administrative module modules are adaptable via the General Systems Preferences embedded in that module, and who reported a high level of 75% satisfaction with the use of Koha OSS administrative module.

Extent of Library Staff's Satisfaction with the Use of the Cataloguing Module of OSS in University Libraries

On the extent of library staff's satisfaction with the use of cataloguing module of OSS in university libraries, the data presented in Table 9 was used to answer the research question.

Table 9: *Mean Responses of Library Staff on the Extent to which they are Satisfied with the Use of the Cataloguing Module of OSS in University Libraries (n = 195)*

SN	I am satisfied using the Cataloguing module of OSS in university libraries	VHE	HE	LE	VLE	$\bar{X}$	Σ	Rmk
1.	Adding New Records	79	104	8	4	3.32	.65	HE
2.	Adding Search Targets	120	71	4	-	3.60	.53	VHE
3.	Choosing Item Types	119	70	5	1	3.57	.57	VHE
4.	Creating Metadata	96	93	5	1	3.45	.57	HE
5.	Z39.50 Search (Copy Cataloguing)	103	75	17	-	3.44	.65	HE
6.	Creating Alternative Search	90	98	6	1	3.62	.58	VHE
7.	Importing Z39.50 Record	87	92	14	2	3.35	.66	HE
8.	Itemization	89	92	9	5	3.35	.70	HE
9.	Editing Records	103	79	10	3	3.44	.66	HE
10	Saving	118	69	7	1	3.55	.59	VHE
	Cluster mean					**3.47**	**.62**	**HE**

Note: $\bar{X}$ = Mean, σ = Standard Deviation of a population, VHE= Very High Extent, HU = High Extent, LE=Low Extent, VLE=Very Low Extent, n = number of respondents, Rmk = Remark.

The data presented in Table 9 showed that the cluster mean is 3.47 and cluster standard deviation is 0.62 respectively. This indicates that the library staff is to a high extent satisfied with the use of cataloguing module of OSS in the management of university libraries. Similarly, the t-test result for the hypothesis is presented in Table 10.

Table 10: *The t – Test Analysis of the Mean Responses of Male and Female Library Staff on the Extent to which they are Satisfied with the Use of the Cataloguing Module of OSS in University Libraries*

Group	N	X	*S*	df	t-cal	Sig. (p-value)	Remark
Male Library Staff	102	3.49	.58	193	1.08	.39	NS
Female Library Staff	93	3.39	.63				

N = Number of respondents, X = Mean of respondents, σ = Standard deviation of a population, df = degree of freedom (193), t-cal= t-calculated, sig. (p-value) = significant at p<.05, NS = Not significant.

The p-value in Table 10 above is 0.39, higher than the alpha-value of 0.05. This shows that there is no appreciable variation in the mean responses of male and female library personnel regarding how satisfied they are with using the OSS cataloguing module. As a result, the hypothesis is approved here.

According to the study's findings, university libraries' staff members are highly satisfied with the cataloguing module of OSS when it comes to adding new records, adding search targets, selecting item types, creating metadata, performing Z39.50 searches (copy cataloguing), producing alternative searches, importing Z39.50 records, itemising, editing records, and saving records. The results of this study corroborated those of Bello (2013), who investigated automated cataloguing techniques and job satisfaction in academic libraries and discovered that the respondents redistribute labour among other catalogers because they are content with their jobs. Sixty one percent (61%) of users with high work satisfaction spend an average of three to six hours each day cataloguing and classifying using Koha OSS.

Randhawa (2016) reported that with technologies, organizing libraries has become easier and more efficient. In a 2012 study, Kushwah, Gautam, and Singh examined two well-known private library management systems. According to the survey, both open source and commercial library management systems have good features and functionalities.

Extent of Library Staff's Satisfaction with the Use of Circulation Module of OSS in University Libraries

On the extent of library staff's satisfaction with the use of the circulation module of OSS in the management of university libraries, data presented in Table 11 is used to answer the research question.

Table 11: *Mean Responses of Library Staff on the Extent to which they are Satisfied with the Use of Circulation Module of OSS in University Libraries (n = 195)*

SN	I am satisfied using the circulation module of OSS in	VHE	HE	LE	VLE	$\bar{X}$	Σ	Rmk
1.	User Registration	105	86	4	-	3.51	.54	VHE
2.	Checking-out Items	106	86	3	-	3.52	.53	VHE
3.	Checking-in Items	105	79	10	1	3.47	.73	HE
4.	Reserving Items (placing items on hold)	77	95	18	5	3.25	.64	HE
5.	Purchase Suggestions	-	84	93	18	2.34	.72	LE
6.	Fine recording	79	97	15	4	3.28	.70	HE
7.	Sending and Receiving Messages	82	98	11	4	3.32	.67	HE
8.	Changing Password	97	84	13	1	3.42	.54	HE
9.	My Summary	82	95	17	1	3.32	.65	HE
10.	My List	123	70	1	1	3.61	.52	VHE
11.	Saving	108	74	12	1	3.48	.63	HE
12.	My Favourite	102	86	5	2	3.47	.70	HE
	Cluster mean					**3.33**	**.63**	**HE**

Note: $\bar{X}$ = Mean, σ = Standard Deviation of a population, VHE=Very High Extent, HU = High Extent, LE=Low Extent, VLE=Very Low Extent, n = number of respondents, Rmk = Remark.

Table 11 revealed that the cluster mean is 3.33 and cluster standard deviation is 0.63 respectively. This indicates that the library staff is to a high extent satisfied with the use of the circulation module of OSS in the management of university libraries. The t-test result for the hypothesis is presented in Table 12.

Table 12: *The t – Test Analysis of the Mean Responses of Male and Female Library Staff on the Extent to which they are Satisfied with the Use of the Circulation Module of OSS in University Libraries*

Group	N	X	*S*	df	t-cal	Sig. (p-value)	Remark
Male Library Staff	102	3.38	.64	193	1.14	.36	NS
Female Library Staff	93	3.31	.60				

N = Number of respondents, X = Mean of respondents, σ = Standard deviation of a population, df = degree of freedom (193), t-cal= t-calculated, sig. (p-value) = significant at p<.05, NS = Not significant.

The p-value in Table 12 above, which is higher than the alpha-value of 0.05 and indicates that there is no statistically significant difference between the mean responses of male and female library personnel regarding how satisfied they are with using the OSS circulation module, is 0.36. The hypothesis is therefore accepted.

The results of this study on the degree of library staff satisfaction with the use of the circulation module of OSS by staff in university libraries show that user registration, checking out and returning items, reserving items (placing items on hold), fine recording, sending and receiving messages, changing passwords, creating lists and favourites, and sending and receiving messages are all very popular. The results of this study are consistent with those of Foley (2016), who stated that modern universities must operate in a digital ecosystem where staff, faculty, and students assume constant access to the internet via free Wi-Fi throughout campus, in the library, canteens, dorms, and even on the playing field or bust stops of which the satisfaction of digital ecosystem in library and information sharing has been satisfactory. Verus Solutions (2015) went on to describe in more detail the functionality of the NewGenLib circulation module, which is made to be relatively easy so that workers at the circulation desk may use it with little to no training. The workers at the circulation desk will be trained on crucial circulation desk duties in less than 30 minutes (Speed in usage). Interfaces are made to be user-friendly and conversational, making it simple to manage large lines of patrons at the circulation desk. A thread (in the server) in the server begins sending an email and SMS to the user about the transaction as soon as it is completed in circulation.

The findings of this study corroborated with Mulla and Chandrashekar (2014) that explored the satisfaction level of software usage in Gulbarga and Belgaum region's Engineering College Libraries in Karnataka and found that schools have tested several OSS, and they testified that Koha's simplicity of use made it the best amongst other software they've used.

As a result, the usage of the administration, cataloguing, and circulation modules of OSS in the management of the university libraries under study was largely regarded as satisfactory by the library staff. As a result, there was no discernible difference in the mean replies of male and female library personnel when it came to how satisfied they are with the modules' use.

Conclusion

According to the report, library personnel heavily utilizes the administration, cataloguing, and circulation modules of OSS to run university libraries. The findings also showed that there is no statistically significant difference between the mean responses of male and female library personnel about the extensive use of various OSS modules. The administrative OSS module was heavily utilised by library staff in the management of university libraries for OPAC configuration, MARC bibliographic framework, setting basic parameters, patrons and circulation control, setting acquisition parameters, adding Z39.50 search targets, system upgrade, managing plug-in, managing the reports module, and system backup/file. The implication of this study is that it will bring about a robust library operations and efficient and effective service delivery leading to high patronage by library users.

Recomendations

Based on the findings of this study, the following reccomendations were made.

i. All university libraries in Nigeria are encouraged to deploy the use of OSS for better library operations and services to users.

ii. Training and retraining for library staff is needed to up date their skills in the use of open source software for better service delivery. This training will improve their skills in OSS use in the libraries as new technologies emerge on daily bases.

iii. The university management should compulsorily engage a system librarian with adequate technological and network operation ideas to facilitate adequate maintenance of the OSS system.

iv. There should be security measures put in place during operations so as to avoid unauthorized persons access / data loss by installing error codes or alarm.

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Conflict of Interest

Authors have no conflict of interest.

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