Library Automation in Higher Education Institutions in Zambia

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Abstract

For many years now, libraries in Sub-Saharan Africa have laggard behind in terms of automation and modernisation of library operations due to among other factors, budgetary constraints, and the high cost of information communication technology (ICT) facilities. Libraries in Zambia including those in Higher Education Institutions (HEIs) are not an exception. This study sought to determine the extent to which libraries in higher education have automated their operations and the type of library management systems used. It also sought to determine the most used library management systems and factors hindering library automation in the higher education sector. The study was quantitative in design, and a survey method was employed in which 142 HEIs libraries were studied. The findings show that 38% (54) of libraries in HEIs have automated their basic functions while 62% (88) reported not having automated their operations. The study also revealed that the majority (77.8%) of libraries in HEIs have automated their operations with free and open source software while 22.11% have used commercial library management systems. Koha was found to be the widely used free and open source library management system among HEIs libraries in Zambia. The challenges to library automation in HEIs in Zambia include a lack of technical support, intermittent internet connectivity, and inadequate ICT skills among librarians in HEIs in Zambia. Given the low level of library automation among HEIs in Zambia, it was recommended that HEIs management should prioritise library automation as this will improve efficiency in library operations.

Keywords: Library Management Systems; Library Automation; Education Institutions; Zambia

1. INTRODUCTION

Since the early 1970s, libraries have used computer systems to automate their operations to improve service delivery. The deployment of library management systems to automate library operations fosters the utilisation of information services and improves the quality of library services (Kumar, 2016). Further, library management systems extend library services to remote users. Library management systems are exciting technologies but also workhorse applications that support the complex tasks of acquiring, describing, and providing access to materials and services (Marshall Breeding, 2019). Library automation systems have added a new dimension to library operations and are expanding the sphere of operations of many libraries (Balasubramanian, 2011).

Before the birth of free and open source library management systems (FOSLMS) in early 2000, the use of library automation systems in libraries was mainly confined to big libraries, such as academic and research libraries, which could afford both the cost of hardware and software (Kochtanek & Matthews, 2002). The omnipresence of FOSLMS such as Koha, Evergreen, ABCD, NewGenLib, and OpenBiblio has given impetus to libraries, especially in developing countries such as Zambia, to automate their operations to bring about efficiency and improved service delivery.

1.1 Statement of the Problem

Library automation in Zambia started in the late 1990s (Mutula, 2012). The University of Zambia library commenced the automation of its operations in 1996 using Dynix, a proprietary library management system that was donor funded (Mwacalimba, 1996). Thereafter, libraries in higher education in Zambia began automating their basic functions using a FOSLMS called CDS/ISIS. To increase library automation in HEIs in Zambia, the Zambian government and its cooperating partners have invested a lot of money and time in the training of librarians from HEIs in Zambia on how to automate their libraries FOSLMS (MESVTEE & VVOB, 2013).

In Zambia and the higher education sector, there is a lack of information on library automation footprint. This is because there is limited or no information on library automation in HEIs. A study by Lungu and Mwamba (2010) only attempted to highlight the challenges of implementing online library database management systems in Zambia using free and open source software (FOSS). The study did not explain the extent of library automation in HEIs in Zambia and the type of library management systems used in the sector. It was therefore important that a study was conducted in HEIs in Zambia to accurately measure the library automation level, the type of library management system used, and the possible challenges.

1.2 Objectives of the Study

The study investigated the use of library management systems in library automation in HEIs in Zambia. In this regard, the study specifically sought to:

i. determine the extent to which libraries in higher education have automated their operations,
ii. establish the type of library management system most used in library automation in HEIs,
iii. establish factors hindering library automation in HEIs in Zambia.

2. LITERATURE REVIEW

The library management system is computer software that is used to automate the operations of a library to ensure efficiency and reduction in costs (Ferguson & Hebels, 2003). It is software that is designed to manage all the functions of a library (Mastersoft, 2024). Library management systems automate functions/activities including acquisition, cataloging, indexing, circulation, and stocktaking. This eliminates the need for repetitive manual work and minimises the chances of errors. According to Hussain (2013), several factors necessitated library automation. These include the explosion of knowledge resulting in numerous specialisations and flow of almost non-stop information; the inability of users to explore unlimited literature; wastage of enormous precious time in handling routine and repetitive library operations; the inability of libraries to acquire all the published information resources; and facilitation of easy, fast, and reliable sharing of resources between libraries, cutting across space and time.

Before the 1970s, all the housekeeping activities in libraries were performed manually. Furthermore, information resources were in print format, and access to such library services was centralised. Users were supposed to be physically in a library building to receive a service. Today, users can access a variety of information and scholarly journals online (Arhtar, 2013). With the implementation of library management systems, library users can access library services remotely in the comfort of their homes and offices. Users can borrow and renew library resources remotely. Further, library users can reserve the materials electronically, and request information resources from other libraries that co-operate with their library online. On the other hand, librarians can provide reference library services online. These and other services of a library have been automated and are accessible online through the Internet.

2.1 Library Management Systems Available on the Market

Several library management systems are available for automation. Both commercial and free and open source library management systems exist. Commercial or closed library management systems require the payment of subscription fees or license fees. On the other hand, free and open source library management systems are freely available for use by libraries to collect, process, store, and distribute information to support decision making on all the activities of libraries such as circulation, acquisition, and cataloguing (Deshmukh, 2016). Table 1 presents some of the prominent and current commercial and free and open source library management systems.

Table 1: Available Commercial and Free and Open Source Library Management Systems

SN	Commercial	Free and Open Source
1	Apollo ILS	BiblioteQ
2	Follett Destiny Library Manager	Evergreen
3	Liberty Library Management Software	Koha
4	SirsiDynix Symphony	NewGenLib
5	Sierra ILS	PMB
6	Polaris ILS	SLiMS

Source: TrustRadius, 2024; Bwalya, 2021

2.2 Library Automation in Zambia

Library automation in the higher education sector has been largely limited to a few university libraries, the University of Zambia, and Copperbelt University libraries (Lungu & Mwamba, 2010). The University of Zambia in 1996 pioneered library automation when it began to automate its library using Dynix, a proprietary library management system that was donor funded (Mwacalimba, 1996). However, in the late 1990s, the library automation landscape in Zambia began to change with the coming of a free library system called Computerised Documentation Services/Integrated Set of Information Systems (CDS/ISIS) which was sponsored by UNESCO. In the late 1980s and 1990s, CDS/ISIS was widely used by libraries in sub-Saharan African countries such as Zambia (Mutula, 2012). The dawn of the 2000 decade saw the birth of robust FOSMLS such as Koha, Evergreen, and SLiMS. The new generation

of FOSLMS is integrated and available for download from the Internet. The birth of FOSLMS has further provided opportunities and choices for higher education institutional libraries in Zambia to automate their operations.

In a bid to accelerate the process of library automation in HEIs in Zambia, many organisations both local and international have been offering training to librarians in the sector on how to use FOSLMS to implement library automation. These include the Flemish Inter-University Council (VLIR-UOS), a Belgium-based organisation, which since 1991 has been offering three months scholarships to librarians from HEIs in developing countries, on how to automate their libraries using FOSLMS such as WINISIS, JISIS and now ABCD. Since 2000, VLIR-UOS through international training programmes called *Stimulate* and *Lib@web* has trained more than 12 librarians from HEIs in Zambia (VLIR-UOS, 2010; VLIR-UOS, 2015). Further, the Indian Government through its Indian Technical and Economic Cooperation (ITEC) has been offering training to librarians from HEIs in developing countries on how to use FOSLMS such as Koha to automate library operations. The International Network for the Availability of Scientific Publications (INASP) has also been training some librarians from HEIs in Zambia on how to use FOSLMS to automate their libraries.

At the national level, the Ministry of Education and Flemish Association for Development Cooperation and Technical Assistance (VVOB) have since 2008 been promoting the use of FOSLMS such as Koha in automating libraries in HEIs in Zambia. In this regard, librarians from all the twelve (12) colleges of education received training from VVOB and the Ministry of Education, Science, Vocational Training and Early Education (MESVTEE) on the use of Koha to automate their library operations (MESVTEE and VVOB, 2013). Further, the Department of Library and Information Science at the University of Zambia has since 2000 been teaching some selected FOSLMS to undergraduate Library and Information Science students to speed up the process of library automation in Zambia.

2.3 Challenges of using Free and Open Source Library Management Systems
The use of library management systems in libraries is not without challenges. A cocktail of challenges has been cited in several studies which include:

2.3.1 Inadequate Technical Support
Technical support is needed for a library using either commercial or FOSLMS. Studies have shown that the issue of inadequate support is more pronounced in the use of FOSLMS where no vendor is supporting a library management system. This was observed in Uganda when Adoma and Ponelis (2015) observed that 77% of 35 academic libraries that had adopted Koha as their library management system experienced the challenge of lacking technical support both during and after the implementation of the system. This was also observed by Muruli and Kumar (2014) who discovered that one of the problems associated with the adoption of FOSLMS in India was the lack of technical support.

2.3.2 Lack of Trained Human Resources
According to Kurmar and Thomas (2009), one of the challenges of library automation is that many libraries face is lack of skilled human resources to handle the library automation systems. As a result, many libraries must hire technical support from the software provider for services such as installation, data migration, and maintenance. Many librarians are poorly trained in ICTs, especially library automation technologies. This is because Library and Information Science school curricula in several countries have weak ICT courses, thereby making it difficult for libraries to have a cadre of staff with ICT skills and competencies needed to operate in the digital era (Munyoro, 2014). This was observed in India by Seena and Sudheir (2014) who discovered a lack of ICT skills among library staff at Kerala University and recommended integrating ICT courses in traditional library and information science programmes.

2.3.3 Maintenance and Other Hidden Costs
All library management systems require maintenance. The fact that many libraries lack staff with the technical skills to maintain both the hardware and library systems, libraries must engage a vendor or a third-party company to maintain the software. This in turn becomes a major burden for libraries, especially in developing countries, where there is a lack of funding. A Koha consulting firm in the USA estimated the cost at USD 10,700, including hardware in the first year of support. Thereafter, the annual support cost would be $2,500 (Riewe, 2008).

Other challenges observed in library automation include intermittent internet connectivity and unstable electricity supply in many developing countries. These two challenges were observed in developing countries such as Zambia. Chisenga (2006) observed that sub-Saharan Africa still has internet connectivity challenges. The intermittent supply of power and poor internet connectivity inhibits the use of library management systems in libraries.

3. METHODOLOGY

The study was quantitative in design and a cross-sectional survey strategy was used to collect data from library staff from HEIs. A complete census of 154 HEIs with functioning libraries was conducted. According to Israel (2013), all respondents should be sampled if the population does not exceed 200. In this regard, one respondent holding the position of Chief librarian or a person in charge of the library in HEI participated in the study. Table 2 below summarises the type and number of HEIs that took part in the survey.

Table 2: Types and Number of Higher Education Institutions for the Survey

SN	Type of HEI	Sample Size	Percentage (%)
1	Colleges of education	46	30
2	Nursing schools	30	19
3	TEVET colleges	40	26
4	Universities	38	25
	Total	**154**	**100**

Data was collected using a questionnaire in which both closed and open ended questions were used. To ensure the reliability and validity of the findings, the questionnaire was piloted in 10 libraries in HEIs. Furthermore, the questionnaire was peer reviewed to ensure that the questions adequately elicit the correct information. The feedback from the 10 libraries helped to refine the questionnaire. The collected data was quantitatively analysed using software called Statistical Package for Social Science (SPSS) version 22 and GNU Not Unix PSPP (GNU PSPP). Descriptive statistics were generated on various questions.

4. RESEARCH FINDINGS

The sample size for this study was 154 HEIs. However, 142 HEIs completed a questionnaire, giving a response rate of 92 %. As seen in Figure 1 below majority the HEIs were colleges of education. Many of the respondents possessed a diploma and bachelor's degree qualifications in Library and Information Science.
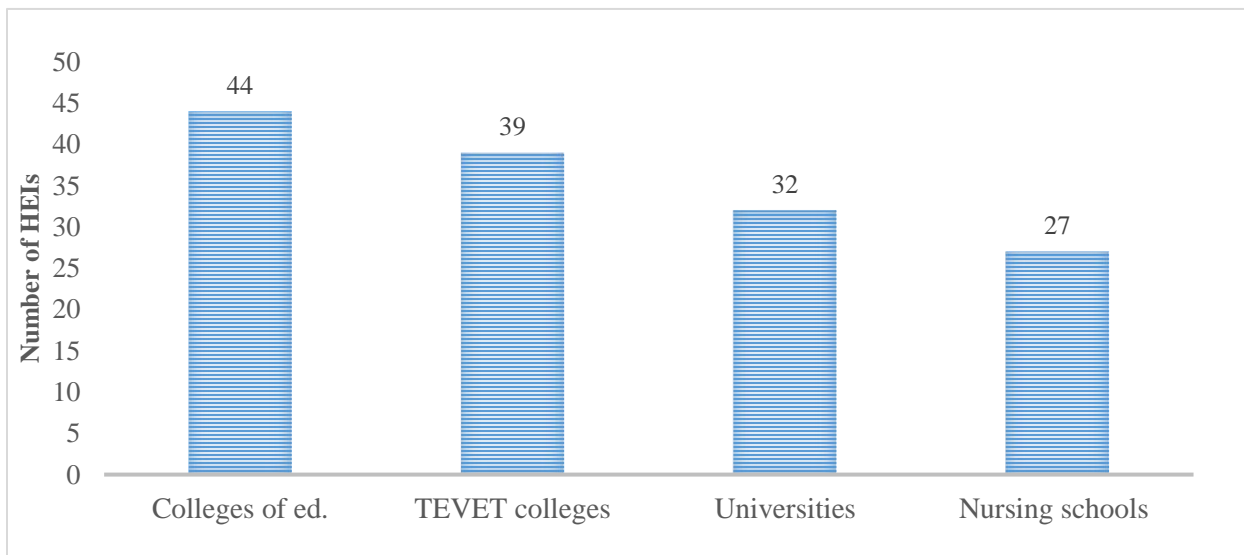

Figure 1: Type and number of Higher Education Institutions that took part in the Survey

4.1 Library Automation in Higher Education Institutions in Zambia

On the issue of using library management systems in automating library operations, 54 (38%) of the respondents indicated to have automated the basic functions or operations of their libraries, while 88 (62%) did not automate their libraries as shown in Figure 2. This implies that 62% of the libraries in HEIs have not automated their operations.
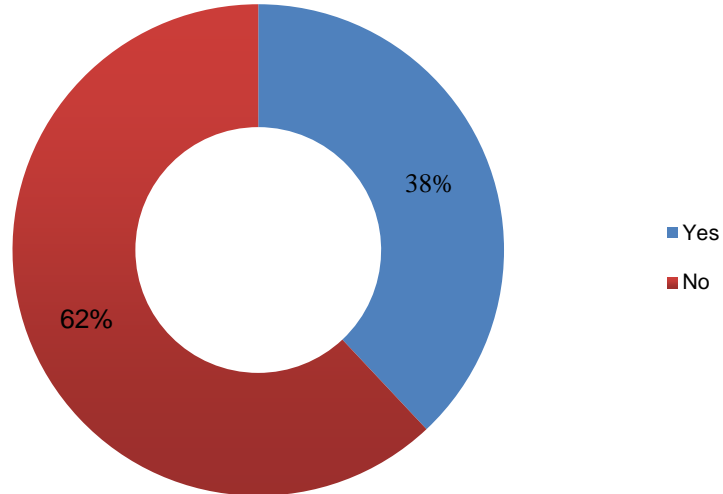

Figure 2: Library Automation Using Library Management Systems

It was further revealed that many (37.03%) of university libraries had automated their operations followed by 27.8% of colleges of education as shown in Figure 3 below.
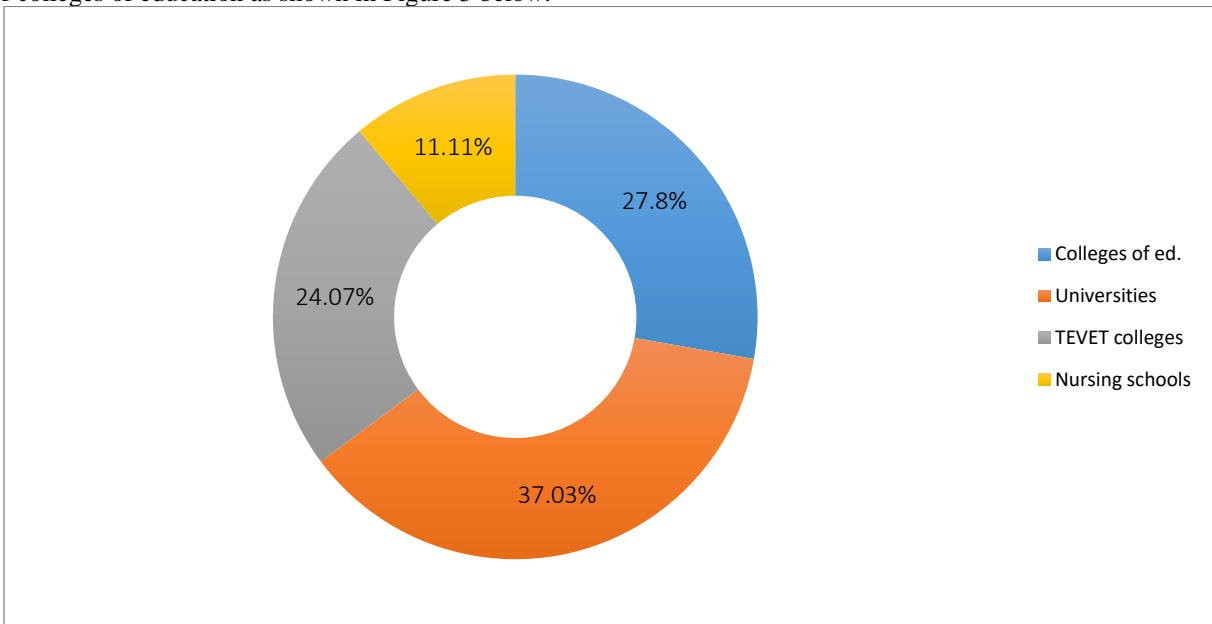

Figure 3: Library Automation by Type of Higher Education Institution

4.2 Type of Library Management System Used in Automation

Among the 54 HEIs who had indicated had automated their libraries, many (42) reported using FOSLMS while 12 indicated using commercial library management systems (CLMS). This implies that FOSLMS was more widely used among HEIs that automated their operations. Further analysis of data revealed that colleges of education had more (14) libraries using FOSLMS followed by universities as shown in Figure 4 below.
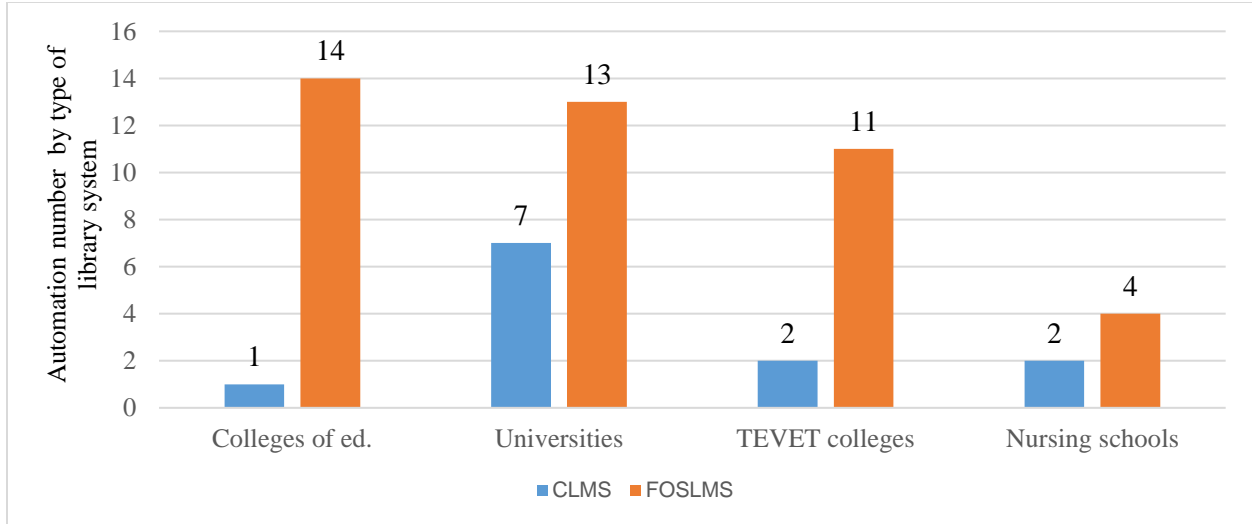
Figure 4: Types of Library Management Systems Used by Type of HEIs

The findings of the study show that almost all (41) HEIs that reported using FOSLMS were using Koha. Only one library was using OpenBiblio. The commercial library management systems that were reported to be being used were Destiny, Library Gold, Unicorn-SirsiDynix, Liberty 5, Librarica, and Astria were also cited in Table 37.

Table 3: Name of the Library System Used by Libraries

| SN | Library management system name | Type of library management | | Total |
		CLMS	FOSLMS	
1	Destiney	2	0	2
2	Liberty5	1	0	1
3	Librarica	1	0	1
4	Library gold	2	0	2
5	Koha	0	41	41
6	Unicorn-SirsiDynix	1	0	1
7	OpenBiblio	0	1	1
8	(Astria and in-house systems)	5	0	5
	Total	**12**	**42**	**54**

4.3 Challenges of Using Library Management Systems for Library Automation

The respondents reported some challenges in using library management systems for library automation. These included difficulties in upgrading the system, challenges in backing up the database, system crashing, and difficulties in recovering the system once crushed. Other challenges included difficulties in using modules found in library management systems, network problems, and a lack of technical support. When the challenges were ranked, difficulty using the system, network problems, and lack of technical support emerged top as shown in Table 4 below.

Table 4: Challenges Using Library Management Systems for Automation

SN	Challenge	Rank
1	Difficult using it	1
2	Network problems	2
3	Lack of Technical support	3
4	Systems crushed and had difficulty recovering it	3
5	Difficult to back up the database	4
6	Difficult to upgrade	4

5. DISCUSSION OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

The research findings revealed that library automation is not widespread in Zambia's higher education sector. At the time of the study, only 38% of libraries in HEIs had automated their operations. This entails that the majority of libraries in HEIs are manually operating. However, the use of FOSLMS was widespread in the higher education sector in Zambia as 42 (78%) out of the 54 HEIs that indicated having automated their operations were using FOSLMS. This implies that only 22% of libraries in HEIs are using CLMS. These research findings are contrary to the research findings by Adera (2013) on the adoption of FOSLMS in Kenya, which showed an equal distribution in the use of FOSLMS and CLMS by libraries.

The fact that 54, out of 142 libraries have automated their operations shows that Zambia still has a huge backlog of libraries in HEIs that have not automated their operations. The low level of library automation is not unique to the higher education sector in Zambia but also to other sectors in the country. Further, the low level of library automation mirrors what is happening in other Sub-Saharan African countries. As discovered in the literature review, libraries in sub-Saharan Africa for many years have remained behind in the sphere of library automation (Mutula, 2012; Khoma, 2003).

The findings of the study point to the widespread use of FOSLMS in HEIs as 78 % of the surveyed libraries in HEIs in Zambia have automated their libraries using FOSLMS. The high number of libraries in HEIs that have automated their operations using FOSLMS is partly attributable to librarians' awareness of the existence of FOSLMS. In Zambia, several training and workshops have been conducted in FOSLMS by the Library and Information Association of Zambia (LIAZ), the Library and Information Science Department at the University of Zambia, and Zambia's co-operating partners (Indian Government, INASP, and VVOB).

The research findings have shown that library automation in HEIs in Zambia is not without challenges as 54.76% of the respondents indicated having challenges. The issue of libraries failing to use all modules of library management systems especially FOSLMS came out as a major challenge in library automation. This may result in the underutilisation of the library system as some services are not functional. Modules that were cited to pose challenges to library staff include budgeting, serials, and reporting. Failure to use all modules in a library management system points to inadequate training of library staff.

The issue of network problems emerged as another major challenge to library automation in HEIs in Zambia. There is intermittent internet connectivity in HEIs in Zambia, thereby posing a challenge to the library staff and users in accessing library systems installed on the servers. This finding is in line with Chisenga (2006) who observed that sub-Saharan Africa still has Internet connectivity challenges. Another challenge cited is a lack of technical skills. As observed by Kurmar and Thomas (2009), many libraries do not have staff with the technical skills to be able to administer library systems such as Koha. The lack of technical skills in library management systems such as Koha was also reported among library staff in Uganda and India (Adoma & Ponelis, 2015; Muruli and Kumar, 2014). This has resulted in many libraries in HEIs in Zambia having difficulties in upgrading and backing up library management systems. For one to be able to upgrade FOSLMS, especially Koha, which is widely used in HEIs in Zambia, he or she has to have Linux command skills.

In conclusion, it can be stated that library automation is not widely spread in HEIs in Zambia. Only 38% of the libraries have automated their operations. Further, it has been established that Koha, a FOSLMS is widely used in HEIs in Zambia. The research has also revealed that library automation faces many challenges which include a lack of

technical skills, and intermittent internet connectivity. Because of the above findings, it is recommended that HEIs and stakeholders in higher education and library science sectors in Zambia should:

    i.   provide capacity training for library staff in HEIs to enhance their skills in library automation systems;

    ii.   improve internet connectivity in HEIs;

    iii.   ensure that library automation is made compulsory for all HEIs that seek accreditation from the higher education authority.

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