Afr. J. Lib. Arch. & Inf. Sc. Vol. 32, No. 1 (April 2022) 1-19

Adoption and Utilisation of Integrated Library Management Systems in Ghanaian Academic Libraries

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Abstract

Academic libraries in Ghana have adopted integrated library management systems (ILMS) to enhance efficiency and to deliver electronic service which is the current trend in the 21st Century. This study investigated the extent of use of ILMS using a qualitative approach in nine academic libraries in Ghana. Findings revealed that all the libraries studied adopted ILMS as individual libraries but are not making optimum use of the ILMS and also there is a general shift towards open-source ILMS with Koha as the preferred choice. The study recommended collaborative approach in the adoption of ILMS with adequate attention to training.

Keywords: Academic Libraries, Integrated Library Management System, Library Management Systems Integrated Library System, Ghana, ILMS

Introduction

Library Management Systems (LMS), Integrated Library Management Systems (ILMS) or Library Service Platform (LSP) are application software used to automate and integrate different library functions related to acquisition, cataloguing, circulation, administration, user management, inter-library interactions, serials management indexing and Online Public Access Catalogue (OPAC) (Kouzari and Stamelos, 2018 and Zainab *et al*, 2018). Academic libraries started using these systems in the 20th Century and they have evolved and expanded to integrated, intelligence and cloud based solutions in the 21st Century (Makori and Mauti, 2016; Pace, 2009; Tyagi and Senthil, 2015; Machovec, 2014; Pruett and Choi 2013; Wang and Dawes, 2012; Kinner and Rigda, 2009; Pace, 2009; Reitz, 2004). The advanced forms of these systems enable libraries to manage their electronic resources and link to other databases, are hosted in the cloud (Cho 2011, Breeding, 2012, Giri 2012, Fu and Fitzgerald 2013, Yang 2013, Madhusudhan and Singh, 2016 and Tyagi and Senthil, 2015), which enable collaboration (Machovec, 2014).

Academic libraries provide well organised information resources and services that support the academic community to acquire knowledge, impart knowledge, investigate problems and provide extension services in universities. They are regarded as warehouse of organised information. The information resources of academic libraries are therefore regarded as strategic resources which serve as foundation for the development of curricula (Makori, 2013). To perform their role in academia effectively in the digital age, academic libraries need to perform their traditional roles of acquisition and distributing of information for scholarly purposes with electronic tools. Digitisation of academic library services will enhance information delivery and make academic information accessible to academics and members of the general public nationally and

internationally (Iwhiwhu and Eyekpegha 2009) and become more relevant (Wasike and Njoroge, 2015). This makes the use of ILMS in academic libraries essential.

Statement of the Problem

Academic libraries worldwide have adopted the use of ILMS to enhance their service delivery. The use of ILMS form part of the technological projects of libraries (Guimaraes *et al*, 2021). This has become the norm in Ghana also with the adoption of a wide range of ILMSs in academic libraries for library automation activities. To enhance the efficiency and effectiveness of ILMS use in academic libraries in Ghana, researchers need to investigate the extent of use in order to identify usage gaps and make recommendations. Unfortunately, this has not been the situation in Ghana as not much research attention has been paid to the use of ILMS. There is also evidence of failure of such applications in many organisations (Marnewick, 2017). Though Amekuedee, (2005) and Boateng *et al*. (2014) studied the automation process in some Ghanaian academic libraries, their works did not reveal the actual extent of use of the ILMS adopted. The aim of this research is therefore to investigate the extent of use of the ILMS that have been adopted by academic libraries in Ghana.

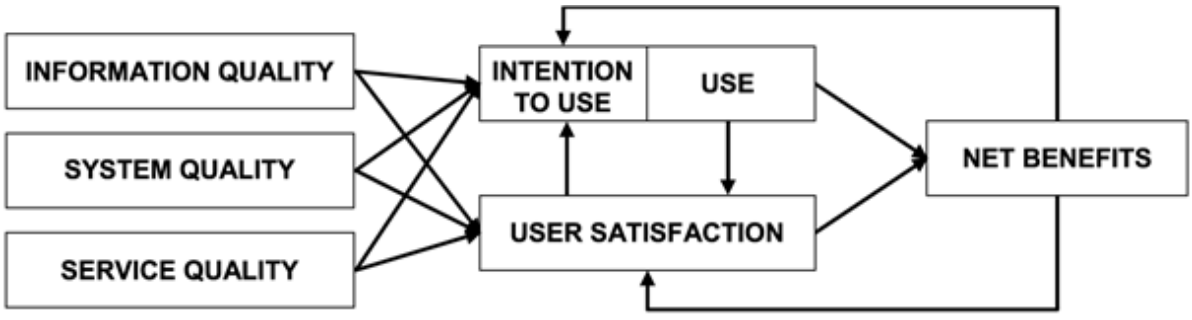
Objectives of the Study

The study seeks to achieve the following objectives by determining the:

- functions ILMS used to perform in academic libraries in Ghana
- extent of utilisation of ILMS in academic libraries in Ghana
- reasons for adopting particular ILMS in Ghanaian academic libraries
- benefits of ILMS use in academic libraries in Ghana.

Theoretical Framework

The DeLone and McLean (2003) Information System Success Theory was adopted as a theoretical framework within which the study was situated. According to the developers of the theory as depicted in *Figure 1*, quality of an information system determines the use and user satisfaction and that people use an information system in order to obtain benefits from it. It is only through actual usage that user satisfaction is derived and the benefit of use is attained. Though the actual intent of Delone and McLean, (2003) is to use the theory to measure the success of information systems, the researchers adopted this theory as it will help achieve the objectives of the study which are to determine the extent of use and the benefit gained from the use of ILMS.



Source: DeLone and McLean (2003)

Figure 1: The DeLone and McLean IS Success Model

Literature Review

In the developed countries, library automation started in the early 1960s and journals such as *Program and Vine* were designed to serve as a source of documentation of the automation projects across the libraries. ILMS application in academic libraries in the developed world is at a very advanced stage. As far back as 1990, library circulation systems were fully automated and allowed self-service to help libraries save cost and users' time (Morris ***et al,*** 2001); Tedd, 2006). ILMS in developed countries started as trial in-house ILMS to the 21st Century robust cloud base systems (Kinner and Rigda, 2009, Groenewegen, 2004). One major trend that is noted in the application of ILMS in libraries in developed countries is the emergence of library consortia to help in the development of ILMS for member libraries as single projects. This enabled the use of common ILMS in member libraries across developed countries (Machovec, 2014 and Cannell and Guy, 2001). The ILMS used in these developed countries was developed single interface for the discovery of diverse resources opening up library data to non-library applications allowing faceted browsing Warren (2007); and are linked to the learning management systems of universities for better patronage (Bell, 2016; Cross, 2015; Detterbeck and Sciangula, 2017, Black and Blankenship, 2010). Studies from these developed countries; Australia, America, United Kingdom and Netherland show that libraries from these countries have moved from the use of ILMS that manages the resources of only a particular library to library service platform that combines the functions of resource sharing, from discovery through to delivery. A Library service platform offers users the ability to use library resources from any location (Evans and Thomas, 2007 and Froud, 2006).

Tyagi and Senthil, (2015) investigated library automation in India by assessing library services platforms through exploratory research. Their findings indicated that library automation in India is at an advanced stage where most libraries have automated various library activities; particularly the web based Online Public Access Catalogues (OPAC) and union catalogues development. A study conducted by Kumar and Biradar (2010) shows that only three out of 31 college libraries in India were fully automated, and eight others were at different stages of automation. The acquisition, cataloguing, circulation, serial control modules of ILMS are being used. Also, Husain and Nazim (2015) conducted a survey on the use of ICT in Indian libraries soliciting responses from librarians to indicate the specific uses of ILMS in the libraries. Results indicated that 85% of the libraries had automated library catalogues, circulation systems and serial control while, 75% are using ILMS for acquisition and budgeting. This confirms Kumar and Biradar's (2010) finding of the services offered with ILMS in India. Easylibsoft, Library Manager, E-Lib, SOUL and Profit+ are among the ILMS being used. Cho (2011) studied the use of cloud service as a means of hosting ILMS and found that they are widely used in Japan, India and other countries and helps libraries reduce cost on hardware and servicing.

Thailand, like India, has had its fair share of ILMS use in its libraries since the 1980s, where the first ever library software to be installed was CDS/ISIS. Apart from CDS/ISIS, some university libraries have installed proprietary ILMS such as URICA, Dynix, INNOPAC, ALICE, TINlib, VTLS classic. One major trend in the use of these commercial ILMS is to provide links to e-resources (Siriwongworawat, 2003). In Pakistan, Siddique and Mahmood (2015) intimated that Pakistan libraries were engaged in automation practices as early as 1968 mainly for cataloguing and inventory; a small number of academic libraries computerised their circulation service at that time. Ramzan (2004) notes that, with regard to library management system in academic and research libraries in Pakistan, 24% of libraries use in-house developed software, 22% use software that were donated, and 23% use proprietary software, and 70% use Library Automation and Management Program (LAMP), CDS/ISIS, and WINISIS, which are free and sponsored by UNESCO and not ILMS. Siddique and Mahmood (2015) expanded the list of the library management systems use in Pakistan to include, dBase, Foxpro, INMAGIC, MINISIS, KITABDAR, Pak Library Software, and Management System, Library World, LIMS, MLIMS, Sci-Mate, and VTLS VIRTUA. Siddique and Mahmood (2015) are however of the view that the different library management systems used by Pakistan libraries do not have local standards and do not provide complete solutions to managing

libraries. Ramzan and Singh (2009) also noted that only a handful of the libraries in Pakistan at the time of their study were fully automated. Though about 50% of the libraries had OPAC, most of them were internal and not web based.

In Nigeria, Bassey, (2016) revealed that the extent of automation in university libraries in Nigeria was 75%; partially automated, 20% are not automated at all and 5% are fully automated. Omeluzor and Oyovwe-tinuoye (2016) also indicated in a study in Nigeria that among eight libraries, only three of the universities had automated their services by using ILMS namely, SLAM- proprietary software and Koha open-source software. The two software were used for retrieving records of library materials but Koha has the feature to link to external databases. Though Omeluzor and Oyovwe-tinuoye (2016) studied university library automation in just one state of Nigeria whereas Bassey, (2016) studied the whole of Nigeria, both studies revealed that there are still some academic libraries in Nigeria that have not adopted ILMS. This finding corresponded with those of Ani *et al.* (2005) who investigated the extent of adoption of ICT in seventeen Nigerian university libraries and revealed that only six of the seventeen libraries were fully using ILMS to provide traditional library services, while five provide access to OPAC. TINLIB was the most popular library software used in Ani *et al.* (2005)'s study. Kari and Baro, (2014) also conducted a survey of all Nigerian libraries that have been using ILMS. KOHA came top of the ILMSs use followed by SLAM and VIRTUA in these libraries. The ILMS was used for cataloguing, OPAC, serials, acquisitions and circulation, collation of staff research output and managing patron records.

Stilwell and Hoskins (2012) embarked on a comprehensive study of library management in South Africa. The major library management systems used in academic libraries were enumerated as Millennium, ALEPH, SirsiDynix and INNOPAC. University libraries in South Africa adopted the above named systems for varied reasons, including, versatility, effective back up, round the clock help from vendors, visit by vendors to undertake major system upgrades, affordability, ability to be web based and extent of adoption by other South African institutions. Stilwell and Hoskins (2012) did not indicate exactly how these systems are used or what they are used for as was done by other researchers in other countries like India, Pakistan and Nigeria.

From the literature, the researchers observed that libraries across the globe have engaged in the use of different ILMS/LMS either based on what is available in their countries or the needs of their libraries. The developed countries have gone beyond using ILMS for cataloguing and circulation to using library services platforms. South Africa, Thailand, Japan and India are trying to catch up with the pace of developed countries but in general, most libraries in the developing countries are not fully utilising all the modules in ILMS that they have installed. The basic functions of acquisition; cataloguing, circulation and OPAC are the most used modules in the ILMS installed and not much was reported on library service platforms.

Proprietary and Open-Source Library Management Systems

The library management systems discussed above come as free software known as open-source library management systems or as proprietary software which libraries have to purchase from vendors. As noted by Upasani (2016:121) 'the present market for ILMS encompasses the spectrum from proprietary systems to open-source software (OSS) systems with a variety of hybrid and customised solutions in between'. Library management systems started as custom-developed home grown or proprietary systems and had very few features. They were used to serve specific needs of libraries. Because the customer base of proprietary library management systems is limited, vendors are able to offer full-service packages of customisation, maintenance, and support. They are expensive, lack flexibility for interoperability with other library management systems, frequent expensive updates force libraries to truncate their subscription and adopt OSS library management systems (Upasani, 2016); the adoption of OSS by libraries for cost reason was also stated by McGarvey (2018).

Open-source software (OSS) has advanced from small based projects to well-funded ones with the involvement of a number individuals/institutions. OSS application in libraries is not a misplaced priority, as both libraries and OSS organisations have the aim of achieving the same end, namely providing

information to aid learning. In the current era of budget cuts in libraries coupled with increasing cost of resources, OSS has served as a great means for libraries to embark on automation activities in a cost-effective manner to meet economic challenges. OSSs are alternatives to proprietary systems and are characterised by free access and an open source code through the programming code which is made publicly available to allow modification of software by the user (Pruett and Choi, 2013). OSSs have the possibility of being opted for by most libraries (Balnaves, 2008). Koha has been identified as the first OS ILMS and the most used compared to others like Evergreen integrated library system, OpenBiblio, PhpMyLibrary, and Emlida with very few user subscriptions (Giri, 2012; Balnaves, 2008). Others listed by Singh and Sanaman (2013) are Avanti MicroLCS, Gnuteca and PhpMyBiblio. Despite the advantages associated with OS ILMS, their adoption by UK libraries, for instance, has been slow (Coyle, 2002; Dalling and Rafferty 2013) but Australia has apparently adopted specific OS ILMS (Keast, 2011). Koha and Evergreen were listed by Breeding (2016) as being used in US academic libraries. In developing countries the use of open source is quite rampant notably in Pakistan (Siddique and Mahmood, 2015), Nigeria (Otunla and Akanmu-Adeyemo, 2010), Kenya (Makori and Mauti, 2016), Uganda (Ponelis and Adoma, 2018), Zimbabwe, Malawi and Mali (Mutula, 2012).

The different studies indicate that the open source ILMS have well developed models and support cloud services. Though they lack certain features, they compare quite well with proprietary ILMS. Libraries everywhere are adopting them, and in the developing countries, the availability of OSS is making it even easier for the adoption of ILMS in libraries due to financial restraints and budget cuts.

Methodology

The study adopted qualitative research design. Qualitative research design helps the researcher to discover and understand the experiences of participants in their real world (Harwell, 2014). This approach is deemed best for this study as it enabled the researchers use interview to best understand the experiences of the librarians in the use of ILMS.

The population of the study is university library members of the Consortium of Academic and Research Libraries in Ghana (CARLIGH). This is made up of 8 public universities and 22 private universities. Being a small population, Durrheim and Painter (2006) recommend 30% to be used as sample size. This gives a sample size of 9 academic libraries.

The sample size was proportionately divided between public and private universities; 2 and 7 respectively. The participating libraries were then purposefully selected base on expert knowledge (Battaglia, 2011) that the libraries use ILMSs.

Structured interview guide was used to conduct interviews with the head of each library selected. This was to enable the researchers ask each respondent the same set of questions. The interviews were recorded using an audio recorder.

The recorded interviews were transcribed using Microsoft word. The audio was played three times to ensure the transcription was accurately done. The transcribed documents were uploaded on to Atlas.ti. The uploaded documents were assigned identification codes. The documents were read for interpretation by identifying key themes that recur across different respondents. Theme codes were generated to help bring together the various comments from different respondents on the same theme. This was used to determine the frequency of occurrence of themes and to identify interesting quotes.

Findings and discussions

Use of LMS/ILMS

The interviews with head librarians revealed that all nine (100%) libraries used an ILMS. The ILMS was installed between the period of 2009 and 2016. The brands used include Sierra by one library (11.1%), Destiny by three libraries (33.3%), Librarysoft by four libraries (44.4%), Koha by seven libraries (77.8%) and Alexandria by one library (11.1%) (Some of the libraries were using two types of ILMS at the same time). See Table 1 for detailed responses.

Table 1: ILMS use (N=9)

Themes	Responses
Sierra	**Librarian 1** - *We use the ILMS Sierra*
Destiny	**Librarian 2** - *Destiny library manager is used* **Librarian 4** - *Koha is used currently, formally Destiny* **Librarian 5** - *The library is using Destiny software which is currently migrating to Koha.*
Librarysoft	**Librarian 3** - *We have Librarysoft, it is extremely frustrating so we just implemented Koha about a month ago* **Librarian 6** - *We are using Librarysoft* **Librarian 7** - *Before Koha we were using Librarysoft* **Librarian 8 –** *We initially subscribed to Librarysoft*
Koha	**Librarian 3** - *We have Librarysoft, it is extremely frustrating so we just implemented Koha about a month ago* **Librarian 4** - *Koha is used currently, formally it was Destiny* **Librarian 5** - *The library is using Destiny software which is currently migrating to Koha.* **Librarian 6** - *Owing to the challenges with Librarysoft we have done consultations and have decided to use Koha.* **Librarian 7** - *Before Koha we were using Librarysoft* **Librarian 8 –** *We use Koha* **Librarian 9** - *we are currently in the process of rolling over our newly adopted software; Koha*
Alexandria	**Librarian 9** - *We are using an ILM; Alexandria*

Purposes for Adopting ILMS for Library Services

In determining the aim of adopting an ILMS, the most cited purposes were to enhance service delivery and quick and easy work procedures (four (44.4%) responses each) and lastly to computerize library work procedures (two (22.2%) responses). Specific responses provided are in Table 2.

Table 2: Purpose of ILMSs use (N=9)

Themes	Responses
Enhanced service	**Librarian 3** – *ILMS and other systems will enhance the services we provide in this library* **Librarian 4** –*The use of Koha is for enhanced services* **Librarian 8** – *Enhance our services* **Librarian 9** – *To automate the library procedures to help serve our users better.*
Fast and easy work procedures	**Librarian 1 –** *The use of the systems comes with a number of advantages such as easy work procedure and speed; that is why we are using them* **Librarian 5** –*To help the university library to automate its functions* **Librarian 6** – *To support our work for efficiency* **Librarian 7** – *The library decided to use the systems for fast and easy retrieval of information*
Automation	**Librarian 2** – *It will help automate all our library functions* **Librarian 9** – *To automate the library procedures to help serve our users better.*

Change of ILMS/ILS

In response to questions on whether the libraries had ever replaced an ILMS and the factors that led to the replacement, eight (88.9%) head librarians indicated they had changed their ILMS. Out of the eight libraries which changed their ILMS, six (75%) of them changed from proprietary software to Koha, an open-source software. At the time of the study, two (22.2%) more libraries were at the consideration stage of changing their ILMS. One of them is considering Koha. Changes are shown in Table 3.

Table 3 Change of ILMS/ILS (N=9)

Themes	Responses
Changed ILMS	**Librarian 1** - *We changed our ILMS from Millenium to Sierra* **Librarian 2 –** *we changed from an in-house system to Destiny*
Changed ILMS to Koha	**Librarian 3 -** *We have Librarysoft, it is extremely frustrating so we just implemented Koha about a month ago* **Librarian 4 -** *Koha is used currently, formally Destiny* **Librarian 6 -** *Owing to the challenges with library soft we have done consultations and have decided to use Koha. We have installed Koha already and have started doing manual entry of all our resources.* **Librarian 7 -** *Before Koha we were using Librarysoft* **Librarian 8 –** *We were never able to install Librarsoft so we moved to Koha* **Librarian 9 -** *we are currently in the process of rolling over our newly adopted software; Koha*
In the processes of changing ILMS	**Librarian 2 -** *I am considering moving to an open-source system. I am learning more on them and will present a proposal to management* **Librarian 5** - *The library is using Destiny software which is currently considering migrating to Koha.*

Reasons for Change of ILMS/ILL

Different reasons were provided for changing from one ILMS to another; technical challenges with a previous ILMS; six (66.7%) respondents), cost associated with ILMS three (33.3%) respondents, need to upgrade service provision; one (11.1%) respondent and the desire to use an ILMS that is used by other universities; one (11.1%) respondent as recorded in Table 4.

Table 4: Reasons for change of ILMS/ILL (N=9)

Themes	Responses
Need for upgrade Cost of old ILMS Technical challenges with old ILMS	**Librarian 1**- *We did not have any major challenges with millennium. It was just a need for change to enhance our services* **Librarian 2** - *I am considering moving to an open-source system. I am learning more on them and will present a proposal to management* **Librarian 4** -*Formerly Destiny was used but the cost associated with its use made us abandoned it.* **Librarian 7**- *We stopped using the old system because it is a paid service. We have chosen Koha because it is an open source and it is more user friendly compered to Librarysoft*
Used by other universities	**Librarian 3** -*It is extremely frustrating; we had issues with Librarysoft and we noticed there is an increased migration to Koha among academic libraries in Ghana* **Librarian 5** -*We had problems using Destiny, cataloguers were not able to log unto the system, it was a technical problem. We tried to solve the problem by liaising with developers and the IT unit.* **Librarian 6** - *Owing the technical challenges with library soft we have done consultations and have decided to use Koha* **Librarian 7**- *We stopped using the old system because it is a paid service. We have chosen Koha because it is an open source and it is more user friendly compered to Librarysoft* **Librarian 8** - *We initially subscribed to Librarysoft. Even the initial installation was a problem, we were depending on the IT staff of another university who has Librarysoft installed to help install it for us. They had a problem with coding issues* **Librarian 9** - *We are migrating to Koha because it comes with all the flexibilities you can think about.*
	Librarian 3 -*It is extremely frustrating; we had issues with Librarysoft and we noticed there is an increased migration to Koha among academic libraries in Ghana*

Reason for Choosing a Particular Brand of ILMS

The researchers tried to establish the reasons for adopting a specific brand of ILMS from those available on the market. Responses revealed that the majority; six (66.6%) of the libraries considered the cost of ILMSs as the most important factor before acquiring it. The next most important factor considered was the use of the ILMS by other libraries; five (55.5%), followed by whether the ILMS can perform the functions of the library; four (44.4%) and lastly ease of use by two (22.2%) of the libraries.

Reasons for using Open-Source ILMS

Seven (77.8%) of the nine head librarians revealed making use of open-source software for core library functions and all seven are using Koha open source ILMS. Three (33.3%) head librarians each indicated that they changed to open-source software as it performs similar functions as the proprietary software, open-source software does not require purchasing cost and that open-source software are being used by other university libraries. Two (22.2%) head librarians changed in response to the open access drive. (Responses are indicated in Table 5).

Table 5: Reasons for open source ILMS (N=9)

Themes	Responses
No subscription cost	**Librarian 4** – *We are using Koha to avoid the challenge of paying subscription fee* **Librarian 8** – *Flexibility and cost are the main reasons for our adoption of open-source software*
Used by other universities	**Librarian 9** – *We adopted the open source because they are free and secure* **Librarian 5 –** *Koha, because a number of universities in Ghana are also using it* **Librarian 6** – *We took cognizance of the fact that most universities even including some big universities are using it*
Reputation/ functionality	**Librarian 3** – *We decided to go with Koha, it has good reputation* **Librarian 8** – *Flexibility and cost are the main reasons for our adoption of open-source software* **Librarian 9** –*We adopted the open source because they are free and secure*
Open-source drive	**Librarian 1** – *Response to the open access drive* **Librarian 9** –*The University, as a whole, supports open-source initiatives. It is part of the culture and explicitly stated in the university's IT policy that if there is an open-source option that should be highly considered.*

Functions ILMS Perform in the libraries

The librarians were asked to indicate the specific functions they used ILMS to perform, collation of responses revealed that all nine (100%) libraries used the cataloguing module, eight (88.9%) used the OPAC, seven (77.8%) used the circulation module, seven (77.8%) used the query and reported generation module, two (22.2%) libraries used the acquisition module while only one (11.1%) library each used their ILMS to send automatic emails, use Myaccount and serial management modules. The interview also revealed that one (11.1%) library had its OPAC only on their Intranet.

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System Integration

The extent of integration between ILMS and the main university system was determined. This level of integration enhances the use of library systems and enables the flow of data between the university system and the library system for a seamless service to the university community. However, it was noted that only one (11.1%) of the nine libraries had some level of integration between the ILMS and the main university system to enable the same user account. Below is the statement from the respondent indicating the level of integration.

> **Librarian 3** -*The ILS is integrated to the university's central authentication system and email system. Students and faculty accounts are same on all systems. The Learning management Moodle is being used and integrated with a reading list management system locally name Nyansapo which is modeled after Loughborough Online Reading List System (LORLS). We are now experimenting to see if we can link this to the Library Management System.*

Expectation and Benefits of ILMSs from the Perspective of Head Librarians

In determining whether their expectations of using ILMSs were being met, five (55.5%) head librarians indicated in the affirmative and the remaining four (44.4%) thought their expectations were not being met. All the nine (100%) librarians mentioned the benefit of time saving and easy work processes, eight (88.9%) mentioned speed of work, seven (77.8%) had experienced the benefit of digital storage of data, six (66.6%) indicated enhanced collaboration, and three (33.3%) acknowledged the visibility of library, collaboration and global access being enhanced. The findings revealed that all the libraries derived one benefit or the other from using ILMS which affirms Delone and McLean's (2003) Theory that information system use leads to benefit.

Maximum Utilisation of ILMSs

The researchers enquired from head librarians their opinion on the extent to which they thought their libraries were utilising the ILMS that they had acquired. Though the response on benefit shows that the libraries were benefiting from the use of ILMS, responses on extent of use revealed that only one librarian indicated the library was making maximum use of their acquired ILMS (11.1%). Two of the comments from the head librarians are as follows:

> **Librarian 1** - *Frankly I don't think the library is making maximum use of the ILMSs that are available in the library; they are being underutilized...*

> **Librarian 2** - *The library is not making maximum use of the systems. I think we are making only 50% use of the system. …*

Reasons given by head librarians for not being able to make maximum use of the ILMSs included lack of initiative to explore all the functions of the ILMS (66.7%), lack of skills to use the systems fully (33.3%) and technical challenges (22.2%).

Staff Attitude Towards use of ILMS

Librarians were asked if staff were happy using ILMS, and if they were not happy and asking what reason(s) accounted for this. Responses listed in Table 6 reveal that it was only in three libraries (33.3%) where staff were happy using ILMS because it made their work easier and served them well. In the rest (66.7%) of the libraries, staff were not happy using the ILMS because of lack of skills (22.2%), technical challenges (44.4%) and being forced to use it (11.1%).

Table 6: Happy to use ILMS (N=9)

Themes	Responses
Easy work schedule	**Librarian 1 -** *I don't know but I am happy using the system because it makes my life and work easier. I think they should be happy. If you talk to people who used the old manual system, they really appreciate the system because it makes their work easier* **Librarian 4 -** *I can say that Koha has served us well, we are happy using it* **Librarian 7 -** *We have started the cataloguing on all campuses and everybody is participating.*
Lack of skills	**Librarian 2 -** *The staff are not happy using the system but use it because that is what is available the reason being that the staff do not have enough training and some staff think it is not user friendly enough* **Librarian 9 -** *I cannot objectively tell if staff are happy using the system or not but I know library staff easily throw in the towel in, and give up on even the minor task they need to perform using IT*
Technical challenges	**Librarian 3 -** *Using Librarysoft is extremely frustrating; we had issues with Librarysoft but once we get Koha running fully, we will be fine using the system* **Librarian 2 -** *The staff are not happy using the system but use it because that is what is available the reason being that the staff do not have enough training and some staff think it is not user friendly enough* **Librarian 5 -** *I don't think staff are happy using the system. Staff will usually complain 'the system is down'* **Librarian 6 -** *Sometimes you enter data and you will not find the data, during searches it does not retrieve all relevant documents; we are not happy with it.*
Use it because they have to	**Librarian 8 -** *The staff do not have a choice but to use them, I can use Koha to determine what staff have done in a particular time. This is a means of checking on the staff to use the system*

Challenge with System Change Over

As shown in Table 7, interviews with head librarians revealed that, five (55.5%) of the nine libraries studied had difficulties with system change over. Two (22.2%) libraries experienced data loss, three (33.3%) could not migrate data from one ILMS to a new ILMS and two (22.2%) libraries were challenged to use two ILMS concurrently. This clearly shows the challenges the library staff encountered in Ghana in an attempt to use ILMS, this also forfeits one of the purposes for using ILMS which is to be able to transfer data from one ILMS to another.

Table 7: System change over challenges

Theme	Responses
Loss of data	Librarian 1 - *We once migrated from a lower version to version 6.2. It looks as if the migration was not planned well, some the collection on the DSpace were no longer accessible on the system. We also have some files relocated from one collection to another; for instance, theses, files moving to article collection. We have to sit and manually move files from one collection to the other. About 500 files were affected* **Librarian 7** - *We lost all our data from Librarysoft, so we are cataloguing every material again*
Inability to migrate data	**Librarian 4** - *We were not able to migrate the library data from destiny to Koha because I did not have the expertise to do that. We tried looking for help from elsewhere, but it could not be done* **Librarian 6** - *We have installed Koha already and have started doing manual entry of all our resources. We decided not to migrate because we have noticed a number of the entries in the Librarysoft are full of errors due to mistakes made by library staff during entries.* **Librarian 9** -*The only challenge we had migrating the data was that we could not migrate our circulation records. As a solution what we will do is we will recall our documents in possession of users during the long vacation in order to close the circulation records in Alexandria; this is already an annual process the library goes through, so we will just intensify it to help us do this exercise. We will possibly be running the two ILMS concurrently for the next one year till we fully train our users*
Using two ILMS concurrently	**Librarian 6** *We are using the two systems concurrently, but Koha is just for data entry and using Librarysoft for all library functions including entry of new books. So, for newly acquired materials we are doing double entries into Koha and Librarysoft for us to still be able to serve our patrons* **Librarian 9** -*The only challenge we had migrating the data was that we could not migrate our circulation records. As a solution what we will do is we will recall our documents in possession of users during the long vacation in order to close the circulation records in Alexandria; this is already an annual process the library goes through, so we will just intensify it to help us do this exercise. We will possibly be running the two ILMS concurrently for the next one year till we have fully trained our users*

Post Implementation System Evaluation and Maintenance

In order to ascertain whether an ILMS was performing as expected, it needed to be evaluated. The results of the interviews show that only two (22.2%) libraries ever evaluated their ILMS. One library used a survey of students while the other used system generated data to determine the usefulness of the ILMS. This situation is not the best, the quality of ILMSs must be ensured and the only way to determine the quality of an information system is through its performance. Once performance evaluation is lacking, it is difficult to determine if the system is meeting the needs of its users. Below are some comments from Head librarians:

Librarian 8 – *We have never evaluated the system but I expect Koha to perform certain functions for us so if I log on to the system and it is not functioning well it means the system is not meeting my needs*

Librarian 5 – *The performance of destiny was never evaluated*

Librarian 4 – *I have not done any formal evaluation. But I can say that Koha has served as well. Destiny was a bit complex to use though destiny could do more than Koha*

Discussion

Use of LMS/ILMS

This study revealed the use of different brands of ILMS in the libraries studied. It was also noted that although all the libraries studied belonged to the same consortium, the ILMS installed was individual project in the various libraries. This finding is similar to the practice of libraries acquiring ILMS individually, rather than as a consortium as revealed by Siddique and Mahmood (2016). This is contrary to the Western trend where a major role of a library consortium is to help acquire ILMS for all member libraries (Machovec, 2014 and Cannell and Guy, 2001). The current practice in Ghana comes with a lot of risk as each library needs to raise a lot of funds to acquire ILMS and needs technical expertise to run the project successfully.

The findings also show that all the libraries were using well-known brands of ILMS with Koha as the most used ILMS. This is an indication that all the libraries studied in Ghana are using standard ILMS as is done in developed countries like the USA and South Africa to enhance standardisation (Breeding 2016; and Stilwell and Hoskins 2012) and not in-house ones that do not enhance standardisation like some libraries in Pakistan (Siddique and Mahmood, 2016). It also affirms the adopted theory that people use information system because of its quality (Delone and McLean, 2003).

Purposes for Adopting ILMS and Function it is used for

Responses from head librarians as shown in the data specified three main purposes for adopting ILMS: to enhance service delivery, for fast and easy work procedure and to automate work processes. These reasons reflect the general consensus in the literature, Iwhiwhu and Eyekpegha (2009) regarding the aim of adopting ILMS in service delivery. This shows that the library fraternity in Ghana is thinking alike with its counterparts in the developed world to provide enhanced service. It also reveals that the libraries have objectives which they expect to achieve from the use of ILMS.

Despite all the great purposes outlined for adopting an ILMS, the data indicates that only the cataloguing module of ILMS was used by all the nine libraries, while the other modules including OPAC, circulation, report and acquisition were not used by all. It was also noted that none of the libraries was using the Electronic Resource Management (ERM) module of the ILMS though their ILMS could perform such a function. This situation is common in Africa and supports the claims of Bassey (2016) and Omeluzor and Oyovwe-tinuoye (2016) that in some libraries in Nigeria, not all library functions were automated and that of Boateng *et al.* (2014) that not all modules of the ILMS were used at the KNUST library in Ghana. Similar situations were recorded in parts of India and Pakistan by Husain and Nazim (2015), Kumar and Biradar (2010) and Ramzan and Singh (2009). This situation is contrary to libraries in developed countries where application of ILMS has advanced to enable self-service Morris et al. (2001) and Tedd (2006) and even in parts of Asia (Tyagi and Senthil, 2015).

There is also lack of integration between ILMS and university systems in Ghana which is contrary to existing literature from developed countries where a number of researchers have shown how academic libraries have been able to integrate their services into existing e-learning management systems of institutions to increase patronage of library services and resources for learning and being able to generate analytical data from ILMSs (Bell, 2016; Cross, 2015; Detterbeck and Sciangula, 2017;Black and Blankenship, 2010).

Findings also indicate that only one librarian felt they were making maximum use of the ILMS deployed. Among the reasons given, it is interesting to note that technical challenges which will affect system quality as indicated in the model adopted was the least mentioned reason for not fully utilising the available ILMS. The findings on the reason why staff

were not happy using ILMS somehow contradicts the findings on the reason why the libraries were not fully utilising the ILMSs. This is because technical challenge was the least of the reasons provided for not fully utilising ILMS but technical challenge was the most cited reason for staff not being happy to use the system. The latter result validates Delone and McLean (2003) theory that the quality of an information system affects its use. It has therefore been revealed by this study that, the use of ILMS in academic libraries in Ghana is not fulfilling its full purpose. The library fraternity in other parts of the world have developed union catalogues to help users request library items from within a consortium or from national or international locations (Evans and Thomas, 2007 and Froud, 2006, Tyagi and Senthil 2015). It was noted in this study that libraries in Ghana did not have a union catalogue. This situation does not market the library facilities within the Ghanaian academic community well enough and also means that the libraries are not taking full advantage of their ILMS.

Libraries not using all the modules of the ILMS to perform library functions means that libraries are not making maximum use of the ILMS, are therefore not getting value for money and affect the quality-of-service delivery as some are still using manual circulation records.

Change of ILMS/ILS

This finding reveals that there is a high ILMS turnover rate among academic libraries in Ghana and is similar to the very high turnover rate of ILMS in Nigerian libraries as indicated by Kari and Baro (2014). It is interesting to note that of the eight libraries which changed their ILMS, six (75%) of them changed from proprietary software to Koha, an open-source software. It is noteworthy that, at the time of the study, two more libraries were at the consideration stage of changing their ILMS. This finding supports evidence in the literature that, Koha was the most preferred open source ILMS, as has been noted by Giri (2012) and Balnaves (2008). It can be deduced that most libraries especially in Africa are opting for open source ILMS and their most preferred brand is Koha as has been revealed by this study.

The chief reason for changing ILMS was indicated as technical challenges with a previous ILMS leading to non-use of ILMS or non-use of some modules. This is referred to as information system failure and has occurred in other organisations as well (Marnewick, 2017). Technical challenge as the most cited reason for changing ILMS in Ghana sits within the premise of quality as the main determinant for use and user satisfaction of information systems (Delone and McLean, 2003). This means that when the libraries experience challenges due to poor quality of the system, they ceased to use the system.

Cost associated with ILMS was the second most cited reason for change followed by need to upgrade service provision and the desire to use an ILMS that is used by other universities. Upasani (2016) recorded the same reasons for libraries relinquishing proprietary ILMS for open-source ones. This also confirms the assertion of both Balnaves (2008) and Pruett and Choi (2013) that Open source software (OSS) are cost saving options for library automation resulting in many libraries now opting for OSS.

Reason for Choosing a Particular Brand of ILMS

Though the reasons given correspond with those given by South African libraries as noted by Stilwell and Hoskins (2012), cost and use by other libraries overshadowed the other critical factors of feasibility studies, ability to meet the library's requirement and ease of use before ILMS installation. The opinion of the researchers is that, though sustainability determined by cost is very important, acquiring an affordable ILMS that will not meet the needs of the library is useless. Likewise, as much as it is important to use ILMS that is being used by others in order to share expertise and information, this factor should not take prominence over ease of use (a major factor of system quality as identified by Delone and McLean (2003) since there will be no value derived from an ILMS not easily used to perform basic functions.

The choice of open source is based on reasons such as minimal cost, performs equivalently to proprietary systems and as a response to the open access drive. This affirms existing literature (Makori and Mauti, 2016; Mutula, 2012; Otunla and Akanmu-Adeyemo, 2010 as well as Siddique and Mahmood, 2015) that OSS is widely adopted in developing

countries as a cost saving means of automation (Upasani, 2016).

From some of the comments presented, some of the librarians thought ILMS performance was based on trusting others' opinions and usage. An ILMS should be tailored to meet the unique needs of each institution.

Conclusion

The study revealed the extent of implementation of ILMS in academic libraries in Ghana. All the libraries studied have implemented an ILMS and have attested to gaining benefits such time saving, easy work processes, speed of work, digital storage of data, collaboration, visibility of library and global access. It was noted that Ghanaian libraries are joining the trend noted in other parts of the world where most libraries are now moving from proprietary ILMS to open- source. The majority of the libraries are using open-source software with most of them having changed from proprietary to open source ILMS. The study revealed that the most used function of ILMS is cataloguing followed by OPAC and circulation, while acquisition recorded very low usage rates. And not all the modules in the ILMS are implemented in all the libraries studied. Also, only one library has integrated its ILMS in to the University wide system.

Although Alexandrai, Koha and Sierra have the capability to support e-resource management, none of the libraries used the ILMS to manage electronic collections. Sierra could also be used for creating the digital repository of the library, but it was not used for that function. This does not support the major purpose of the development of the next generation ILMS which is the provision of unified workflows.

Recommendations

One of the benefits of ILMS use is the ability to establish a union catalogue that will serve as a visibility point for the collection of all academic libraries' resources which can be accessed by anybody from any part of the world. Academic libraries have been using ILMS in Ghana for over ten years now. They should therefore establish a union catalogue.

Member libraries of CARLIGH should consider acquiring a common ILMS and put a team of experts together to help roll over the system to all member libraries. This will help in the easy implementation of the system at a reduced cost for members and the assurance of availability of experts to help install the ILMS.

Libraries should also ensure they have tested the ILMS they want to purchase to guarantee that it will perform to their satisfaction before it is acquired. This will avoid the current situation of acquiring an ILMS and abandoning it later due to technical challenges. Training and sensitising of library staff on the use of ILMS for specific library functions should be made a priority in libraries as the ability and willingness to use the ILMS is a pre-requisite to the effectiveness of the system.

Acknowledgement

The financial assistance of the National Institute for the Humanities and Social Sciences under grant number APS16/1070, in collaboration with the Council for the Development of Social Science Research in Africa towards this research is hereby acknowledged. Opinions expressed and conclusions arrived at are those of the author and are not necessarily to be attributed to the NIHSS and CODESRIA.

References

Amekuedee, J. O. (2005). An Evaluation of Library Automation in Some Ghanaian University Libraries. *The Electronic Library*, *23* (3), 442–452. https://doi.org/10.1108/02640470510611508

Ani, O. E., Esin, J. E., and Edem, N. (2005). Adoption of Information and Communication Technology (ICT) In Academic Libraries: A Strategy for Library Networking in Nigeria. *The Electronic Library*, *23* (6), 701–708. https://doi.org/doi.org/10.1108/02640470510635782

Balnaves, E. (2008). Open Source Library Management Systems: A Multidimensional Evaluation. *Australian Academic and Research Libraries*, *39* (1), 1–13. https://doi.org/10.1080/00048623.2008.10721320

Bassey, R. (2016). Adoption of Software Packages in University Libraries in Nigeria. *Library Philosophy and Practice*, *Paper 1342*(April). http://digitalcommons.unl.edu/libphilprac/1342

Battaglia, M. P. (2011). *Purposive Sample In: Encyclopedia of Survey Research Methods*. https://doi.org/10.4135/9781412963947

Bell, B. (2016). Training Academic Library Staff Using an Online Learning Management System (LMS). *The Bottom Line*, *29* (4), 237–240. https://doi.org/10.1108/BL-02-2016-0008

Black, E. L., and Blankenship, B. (2010). Linking Students to Library Resources through the Learning Management System. *Journal of Library Administration*, *50* (5/6), 458–467. https://doi.org/10.1080/01930826.2010.488587

Boateng, H., Agyemang, F. G., and Dzandu, M. D. (2014). The Pros and Cons of Library Automation in a Resource Challenged Environment: A Case Study of KNUST Library. *Library Philosophy and Practice*, *Paper 1061*. http://digitalcommons.unl.edu/libphilprac/1061

Breeding, M. (2012). Automation Marketplace 2012: Agents of Change. *Library Journal*, *March*. http://www.thedigitalshift.com/2012/03/ils/automation-marketplace-2012-agents-of-change/

Breeding, M. (2016). Library System Report 2016. *American Library Magazine*. https://americanlibrariesmagazine.org/2016/05/02/library-systems-report-2016/

Cannell, S., and Guy, F. (2001). Cross-Sectoral Collaboration in the Choice and Implementation of a Library Management System: The Experience of the University of Edinburgh and the National Library of Scotland. *Program*, *35* (2), 135–156. https://doi.org/doi.org/10.1108/EUM0000000006945

Cho, J. (2011). Study on a SaaS-based Library Management System for the Korean Library Network. *The Electronic Library*, *29*(3), 379–393. https://doi.org/10.1108/02640471111141115

Coyle, K. (2002). Open Source, Open Standards. *Information Technology and Libraries*, *21*(1), 33–36. https://doi.org/10.1108/PROG-06-2012-0034

Cross, R. (2015). Implementing a Resource List Management System in an Academic Library. *The Electronic Library*, *33* (2), 210–223. https://doi.org/10.1108/EL-05-2013-0088

Dalling, J., and Rafferty, P. (2013). Open Source, Open Minds?: An Investigation Into Attitudes Towards Open Source Library Management Systems in UK Higher Education Libraries. *Program*, *47* (4), 399–423. https://doi.org/doi.org/10.1108/PROG-06-2012-0034

Delone, W. H., and McLean, E. R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*, *19* (4), 9–30. https://doi.org/10.1080/07421222.2003.11045748

Detterbeck, K., and Sciangula, M. (2017). Innovation through Collaboration: Using an Open-Source Learning Management System to Enhance Library Instruction And Student Learning. In: T. Maddison and M. Kumaran (Eds.), *Distributed Learning* (pp. 221–238). Elsevier Ltd. https://doi.org/10.1016/B978-0-08-100598-9.00012-X

Durrheim, K., and Painter, D. (2006). *Research in Practice: Applied Methods For Social Sciences* (M. T. Blanche, K. Durrheim, and D. Painter (eds.)). University of Cape Town Press.

Evans, M. F., and Thomas, S. (2007). Implementation of an integrated Information Management System at the National Library of Wales: A Case Study. *Program*, *41*(4), 325–337. https://doi.org/doi.org/10.1108/00330330710831558

Froud, R. (2006). Unity reaps Rewards: An Integrated UK ILL and Resource Discovery Solution For Libraries. *Interlending and Document Supply*, *34*(4), 164–166. https://doi.org/doi.org/10.1108/02641610610714731

Fu, P., and Fitzgerald, M. (2013). A Comparative Analysis of the Effect of the Integrated Library System on Staffing Models in Academic Libraries. *Information Technology and Libraries*, *32*(September), 47–58. https://doi.org/10.6017/ital.v32i3.3388

Giri, R. (2012). NewGenLib 3: An Integrated Open Source Library Management System that makes your Library Visible in Web. *Library Hi Tech News*, *29*(10), 4–12. https://doi.org/10.1108/07419051211294464

Groenewegen, H. W. (2004). Four Decades of Library Automation: Recollections and Reflections. *The Australian Library Journal ISSN:*, *53*(1), 39–53. https://doi.org/doi.org/10.1080/00049670.2004.10721612

Guimaraes, A., Briggs, L., Clark, K., Tressler Jasper, W., and Wang, Z. (2021). State of Project Management in Libraries. *Journal of Library Administration*, *0*(0), 1–15. https://doi.org/10.1080/01930826.2021.1947055

Harwell, M. R. (2014). Research Design In Qualitative/Quantitative/Mixed Methods.In : C. F. Conrad and R. C. Serlin (Eds.), *The SAGE Handbook for Research in Education: Pursuing Ideas As The Keystone Of Exemplary Inquiry* (pp. 147–164). SAGE Publications, Inc. https://doi.org/10.4135/9781483351377

Husain, S., and Nazim, M. (2015). Use of Different Information and Communication Technologies in Indian Academic Libraries. *Library Review*, *64*(1/2), 135–153. https://doi.org/doi.org/10.1108/LR-06-2014-0070998

Iwhiwhu, B. E., and Eyekpegha, E. O. (2009). Digitization of Nigerian University Libraries from Technology Challenge to Effective Information Delivery. *The Electronic Library*, *27*(3), 529–536. https://doi.org/10.1108/02640470910966943

Kari, K. H., and Baro, E. E. (2014). The Use of Library Software in Nigerian University Libraries and Challenges. *Library Hi Tech News*, *31* (3), 15–20. https://doi.org/dx.doi.org/10.1108/02640470510611508

Keast, D. (2011). A survey of Koha in Australian Special Libraries: Open Source Brings New Opportunities to the Outback. *International Digital Library Perspectives*, *27*(1), 23–39. https://doi.org/10.1108/10650751111106537

Kinner, L., and Rigda, C. (2009). The Integrated Library System: from Daring to Dinosaur? *Journal of Library Administration*, *49* (4), 401–417.https://doi.org/10.1080/01930820902832546

Kouzari, E., and Stamelos, I. (2018). Process Mining Applied on Library Information Systems: A Case Study. *Library and Information Science Research*, *40* (3–4), 245–254. https://doi.org/10.1016/j.lisr.2018.09.006

Kumar, S. B., and Biradar, B. (2010). Use of ICT in College Libraries in Karnataka, India: A Survey. *Program*, *44* (03), 271–282. https://doi.org/doi.org/10.1108/00330331011064267620

Machovec, G. (2014). Consortia and Next Generation Integrated Library Systems. *Journal of Library Administration*, *54* (5), 435–443. https://doi.org/10.1080/01930826.2014.946789

Madhusudhan, M., and Singh, V. (2016). Integrated Library Management Systems. *The Electronic Library*, *34* (2), 223–249. https://doi.org/10.1108/EL-08-2014-0127

Makori, E. O. (2013). Adoption of Radio Frequency Identification Technology in University Libraries: A Kenyan Perspective. *The Electronic Library*, *31*(2), 208–216. https://doi.org/doi.org/10.1108/02640471311312384

Makori, E. O., and Osebe, N. M. (2016). Koha Enterprise Resource Planning System and its Potential Impact on Information Management Organizations. *Library Hi Tech News*, *33* (4), 17–23. https://doi.org/10.1108/LHTN-01-2016-0005

Marnewick, C. (2017). The Reality of Adherence to Best Practices for Information System Initiatives. *International Journal of Managing Projects in Business*, *10*(1), 167–184. https://doi.org/dx.doi.org/10.1108/IJMPB-05-2016-0045

McGarvey, V. (2018). Staffordshire University's Koha Journey: Taking an Integrated Approach to Supporting an Open Source Library Management System. *Insights: The UKSG Journal*, *31*, 1–7. http://10.0.6.93/uksg.411%0Ahttps://up.idm.oclc.org/login?url=http://search.ebscohost.com/login.aspx?direct=trueanddb= lihandAN=133436558 andlang=esandsite=ehost-liveandscope=site

Morris, A., Thornley, L., and Snudden, K. (2001). Self-Issue And Return Systems: Experiences in the UK. *The Electronic Library*, *19* (1), 7–18. https://doi.org/doi.org/10.1108/EUM0000000005398

Mutula, S. M. (2012). Library Automation In Sub Saharan Africa: Case Study of the University of Botswana. *Program*, *46* (3), 292–307. https://doi.org/10.1108/00330331211244832

Omeluzor, S. U. and Oyovwe-tinuoye, G. O. (2016). Assessing the Adoption and Use of Integrated Library Systems (ILS) for Library Service Provision in Academic Libraries in Edo and Delta states, Nigeria. *Library Review*, *65* (8/9), 578–592. https://doi.org/10.1108/LR-01-2016-0005

Otunla, A. O., and Akanmu-Adeyemo, E. A. (2010). Library Automation in Nigeria: The Bowen University Experience. *African Journal of Library, Archives and Information Science*, *20* (2), 93–102.

Pace, A. (2009). 21st Century Library Systems. *Journal of Library Administration*, *49*(6), 641–650. https://doi.org/10.1080/01930820903238834

Ponelis, S. R., and Adoma, P. (2018). Diffusion of Open Source Integrated Library Systems ln Academic Libraries in Africa: The Case of Uganda. *Library Management*, *39* (6–7), 430–448. https://doi.org/10.1108/LM-05-2017-0052

Pruett, J., and Choi, N. (2013). A Comparison Between Select Open Source and Proprietary Integrated Library Systems. *Library Hi Tech*, *31* (3), 435–454. https://doi.org/10.1108/LHT-01-2013-0003

Ramzan, M. (2004). Levels of Information Technology (IT) Applications in Muslim World Libraries. *The Electronic Library*, *22* (03), 274–280. https://doi.org/doi.org/10.1108/02640470410541688

Ramzan, M., and Singh, D. (2009). Status of information Technology Applications in Pakistani Libraries. *The Electronic Library*, *27* (4), 573–587. https://doi.org/10.1108/02640470910979543

Reitz, J. M. (2004). *Dictionary of library and Information Science*. Libraries Unlimited.

Siddique, N., and Mahmood, K. (2015). Status of Library Software In Higher Education Institutions of Pakistan. *International Information and Library Review*, *47*(3–4), 59–65. https://doi.org/10.1080/10572317.2015.1087796

Siddique, N., and Mahmood, K. (2016). Combating Problems Related to Library Software in Higher Education Institutions of Pakistan: An Analysis of Focus Groups. *Malaysian Journal of Library and Information Science*, *21* (July), 35–51. https://doi.org/doi/abs/10.1080/10572317.2015.108779

Siriwongworawat, S. (2003). Use of ICT in Thai Libraries: An Overview. *Program*, *37* (1), 38–43. https://doi.org/doi.org/10.1108/00330330310460581

Stilwell, C., and Hoskins, R. (2012). Integrated Library Management Systems: A Review of Choices Made and their Sustainability in South Africa. *Information Development*, *29* (2), 154–171. https://doi.org/10.1177/0266666912454067

Tedd, L. A. (2006). Program: Record of the First 40 Years of Electronic Library and Information Systems. *Program*, *40* (1), 11–26. https://doi.org/doi.org/10.1108/00330330610646780

Tyagi, A. K., and Senthil, V. (2015). Library Automation in India: Assessment of Library Services Platforms. *DESIDOC Journal of Library and Information Technology*, *35* (6), 408–416. https://doi.org/doi.org/10.1007/s11274-015-1903-5

Upasani, O. S. (2016). Advantages and Limitations of Open Source Software for Library Management System Functions: The Experience of Libraries in India. *Serials Librarian*, *71*(2), 121–130. https://doi.org/10.1080/0361526X.2016.1201786

Wang, Y., and Dawes, T. A. (2012). The Next Generation Integrated Library System: A Promise Fulfilled. *Information Technology and Libraries*, *31* (3), 76–85. https://doi.org/10.6017/ital.v31i3.1914

Warren, J. (2007). Directors' Views of the Future of Cataloguing in Australia and New Zealand: A Survey. *Australian Academic and Research Libraries ISSN:*, *38* (4), 239–251. https://doi.org/10.1080/00048623.2007.10721306

Wasike, J. M., and Njoroge, L. (2015). Opening Libraries to Cloud Computing: A Kenyan Perspective. *Library Hi Tech*, *32* (03), 21–24. https://doi.org/doi.org/10.1108/LHTN-09-2014-0072

Zainab, A. M., Kiran, K., Karim, N. H. A., and Sukmawati, M. (2018). UTAUT's Performance Consistency: Empirical Evidence from a Library Management System. *Malaysian Journal of Library and Information Science*, *23* (1), 17–32. https://doi.org/10.22452/mjlis.vol23no1.2

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