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ADOPTION FACTORS OF INTEGRATED LIBRARY MANAGEMENT SYSTEMS (ILMS) IN SELECTED NIGERIAN UNIVERSITY LIBRARIES

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Abstract

Adoption of Integrated Library Management System (ILMS) in Nigerian university libraries is becoming popular. However, the literature review revealed that many libraries have been moving from one system to another and in the process losing a large chunk of library records. This situation poses a serious threat not only to ILMS adoption but also to its use. This study, therefore, sought to determine adoption factors of ILMS in Nigerian university libraries. The study design was descriptive of the qualitative survey. Twenty-five Systems Librarians from the selected university libraries formed the population. Data collection instrument was an interview checklist. Results showed that technological, library and librarians' factors and libraries funding patterns were the main factors that determined ILMS adoption in the libraries. The study concluded that the ILMS adoption factors would ensure long use of the selected ILMS if the factors are considered before adoption. It, therefore, recommended that libraries willing to adopt ILMS should formulate policy based on the adoption factors.

Introduction

Adoption and usage of information systems in present day organizations is growing rapidly. The increased quality of new information systems with their benefits is major factors that explain their massive use in almost every type of organization. The application of computing/information systems in libraries has been a subject of interest to libraries and professional librarians for more than sixty-five (65) years (Rochtanek & Matthews, 2002). Recently, libraries have sought to increasingly implement software solutions that involved distributed networking and access to remote information resources through the deployment of various library information systems. An Information System (IS) is generally considered to be a set of interrelated components that collect, manipulate and disseminate data and information which equally provide a feedback mechanism to meet an objective (Sadeh & Ellingsen, 2005).

Adoption of ILMS has come a long way of libraries in Nigeria, over an often irregular path, since the 1930s, when elite libraries began to integrate IBM equipment into the circulation routines of their library services. However, serious implementation of information technology to library services began in Nigerian university libraries in the early 1990s (Nok, 2006). Individual attempts at library automation such as the one by the University of Lagos, University of Ibadan, and Ahmadu Bello University, Zaria, in the mid-1970s and 1980s, collapsed largely because of lack of technical know-how relating to software development and maintenance of hardware (Alabi, 1987). Agboola (2000) stated that the greatest impulse to library automation in university libraries in Nigeria so far came from a World Bank project. The World Bank gave automation in the university libraries as one of its considerations for assistance. As a result, the National University Commission (NUC) allocated one microcomputer and a four-user local area network version of the TINLIB (The information Navigator) software to each of the 20

partaking libraries in 1992. This was after an agreement had been reached between the NUC and the University Librarians that all Federal Universities use common software.

However, missing in the literature are factors that led to adoption of ILMS in Nigerian university libraries. Studies conducted by Alabi (1987), Ogunleye (1997), Agboola (2000), Adegbore (2010) and Okewale and Adetiminrin (2011) were all focused on automation of university library while issues of factors determining adoption of ILMS were just paraphrased. Integrated library management system are being developed or purchased by libraries especially university libraries who are adjudged the most developed libraries in Nigeria (Ogunsola, 2005) for the routine functions of acquisition, cataloguing, serial processing, etc in the library. These software and other computer accessories do not come cheaply. The software are costly, have to be preserved and the annual maintenance agreement serviced (Ayankola, 2012). It is therefore, expected that these software should bring out results. The major retrogress in this respect is that once the software breaks down, access to books and other information materials are constrained. It is against this background that this study sought to determine adoption factors of ILMS in Nigerian University Libraries.

Theoretical background

This study views library as a single unit of analysis as far as adoption of integrated library management system is concerned. For this reason, this study searched for theory or model of studying adoption of information systems in organization. In the light of this, the study found Al-Mamary, Shamsuddin, and Aziati (2014) Management Information Systems Adoption by Organizations (MISAO) model relevant simply for the fact that the Al-Mammary et al (2014) views organizations as a single unit of analysis. Hence, this study equally views libraries as single unit of analysis and adopted their MIS adoption model.

Three major categories as important dimensions of management information system (MIS) adoption in organizations were proposed by (Al-Mamary, Shamsuddin, & Aziati, 2014) they were technological, organizational and people factors. The authors used the variables to test factors influencing the adoption of MIS by the telecommunication companies in Yemen and validated the outcome model through a qualitative study conducted with the resultant model referred to as management information system adoption by organization (MISAO) model.

Al-Mamary, Shamsuddin, and Aziati (2014) Management Information System Adoption by Organization (MISAO) Model is an adoption of information model focusing on organization as a unit of analysis. The model was proposed after synthesizing from the literature on MIS adoption in organizations and interviews with some of the employees of telecommunications companies in Yemen based on a theoretical framework that took into consideration the technological, organizational and people dimensions that might affect MIS adoption in organizations. The model is based on seven factors. Those factors are categorized into three categories which are technological, organizational and people characteristics.
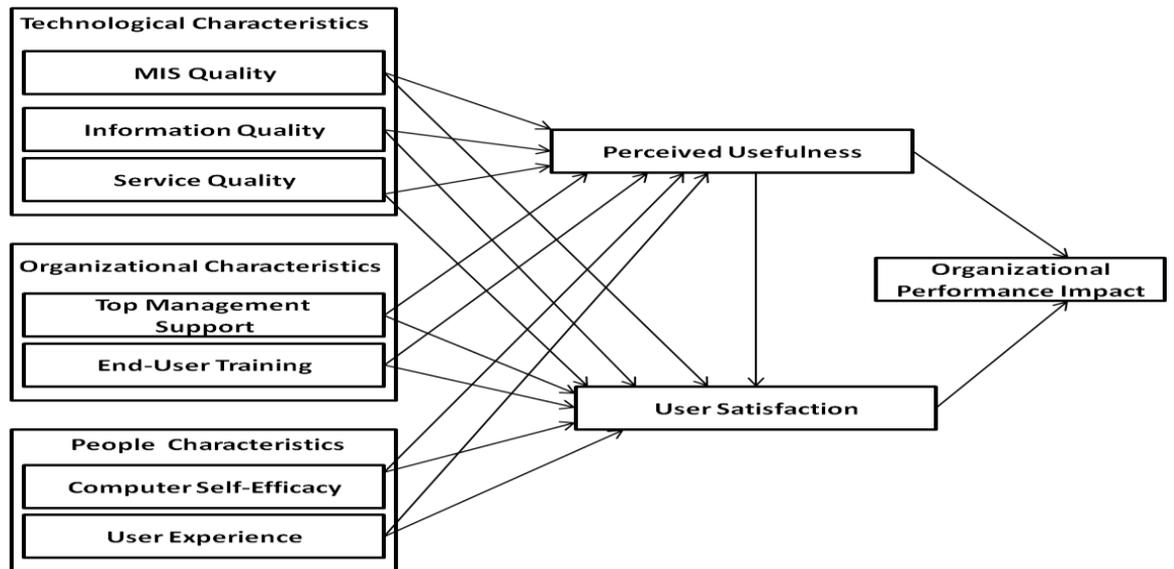
Figure 1: Management Information System Adoption by Organizations (MISAO) Model (Al-Mamary, Shamsuddin, & Aziati, 2014)

The model guided this study in the bid to find out adoption factors of integrated library management system by libraries. Technological characteristics had three variables which were MIS system quality, MIS output quality and MIS service quality. And for the purpose of this study, technological characteristics was renamed as technological factors and was still modified by the three variables mentioned above. The second factor in the model is organizational characteristics and for the purpose of this study was adapted as library factors. This construct had two modifying variables which were top management support and user-training. The third construct in the model was people characteristics which was adapted as Librarians factors. Librarians factors was modified by computer self-efficacy and user experience. These constructs as modified in this study guided the libraries' adoption of ILMS aspect of this work.

The justification for the modification was based on the fact that the study which first introduced the model was carried out in a field different to librarianship while the information systems studied was equally not the same with the one in this studied. The modification was also necessary in order to allow for other items to be adapted to the constructs of the model.

Research Questions
Answers were provided to the following research questions.
1. What are the factors that are considered by Nigerian university libraries before adopting ILSM??
2. What is the influence of technological factors on adoption of ILMS by university libraries in Nigeria?
3. What is the influence of library factors on adoption of ILMS by university libraries in Nigeria?
4. What is the influence of Librarians' factors on adoption of ILMS by university libraries in Nigeria?
5. What are the types of ILMS adopted by Nigerian university libraries?
6. What are the factors responsible for migration by Nigerian university libraries from one library software to the other?
7. What are the ways of minimizing errors in the adoption of ILMS in Nigerian university libraries

Methodology

This study utilized qualitative method in the data gathering process of the research. The reason for using this form of investigation was that it is insufficient to answer the research questions set for this study. The survey design was adopted in this study; the population of the study comprised of twenty-eight (28) systems librarians in the twenty-eight (28) Nigerian university libraries selected for this study. The yardstick for the selection of these universities was based on evidence of having implemented an ILMS-Integrated Library Management System since the aim of the study was to determine adoption factors of integrated library management systems in Nigerian university libraries.

Due to the small number of respondents in the selected universities, this study adopted total enumeration technique. This was to ensure that data collected will be a true representation of the situation in the selected university libraries.

Table 1: Selected Universities, Year Founded, ILS/LMS Software in use, Study Population/Number of Librarians

S/n	University	Year founded	ILS/LMS software in use
1	University of Ibadan, Ibadan	1948	Visionary Technology in Library Solution (VIRTUA)
2	University of Nigeria, Nsukka	1960	KOHA
3	Ahmadu Bello University, Zaria	1962	VIRTUA
4	Obafemi Awolowo University, Ile-Ife	1962	VIRTUA
5	University of Lagos, Lagos	1962	Millennium
6	University of Ilorin, Ilorin	1975	KOHA
7	University of Jos, Jos	1975	VIRTUA, ITS, KOHA
8	University of Port-Harcourt, Port-Harcourt	1975	VIRTUA
9	Federal University of Technology, Owerri	1980	KOHA
10	Federal University of Technology, Akure	1981	Strategic Library Automation Management (SLAM)
11	Nigerian Defense Academy, Kaduna	1985	Liberty
12	University of Agriculture, Markudi.	1988	KOHA
13	Michael Okpara Uni. Of Agric., Umudike	1992	CDS ISIS
14	Nnamdi Azikiwe University, Awka	1992	KOHA
15	Nigerian Police Academy, Wudil, Kano.	2012	KOHA
16	Lagos State University, Ojo, Lagos.	1983	Alice for Window
17	Ekiti State University, Ado Ekiti	1988	Strategic Library Automation Management (SLAM)
18	Ladoke Akintola University of Technology, Ogbomoso	1990	KOHA
19	Benue State University, Markudi	1992	KOHA
20	Adekunle Ajasin University, Akungba.	1999	SLAM
21	Kogi State University Anyigba	1999	SLAM
22	Babcock University, Ilishan-Remo	1999	KOHA
23	Bowen University, Iwo	2001	KOHA
24	Covenant University, Ota	2002	Millennium
25	American University of Nigeria, Yola	2005	Greenstone
26	Redeemer's University, Ede	2005	KOHA
27	Adeleke University, Ede	2011	KOHA
28	Landmark University, Omu-Aran.	2011	Millennium
			Total

Sources:
1. University names and years founded
http://www.nuc.edu.ng/pages/universities.asp?ty=1&order=inst_name&page=2
2. ILS/LMS software in use and study population.
Field Survey (January, 2015)

This study opted to conduct an in-depth interview of the systems librarians judging by their small number (one each from the selected university libraries) to elicit information on the determinants of ILMS adoption in their libraries. The data collection instrument was an interview checklist synthesized from the constructs of the adapted model. The interview technique enables the researcher to collect firsthand information about the respondents' knowledge, values, attitudes, beliefs and preferences. The structured interview schedule contained twenty six (26) questions. It was based on the constructs from the adopted model and spread across technological factors, organizational factors, librarians' factors and other latent factors on adoption of ILMS. The questions were open ended and the reason for the open ended interview schedule was to give room for free flow of information from respondents. Data was analyzed using thematic technique.

Findings

Research Question 1: What factors were considered by Nigerian university libraries before adopting ILMS?

Research question one was answered by three interview questions viz; Sir/Ma, has your library adopted (the interviewer mentioned the software in use in the library which) an integrated library management system (ILMS)?

1. In choosing the ILMS, which of the following factors were considered
a. Technological factors (i.e. the ILMS's Quality) which comprises of System Quality, Information Quality and After Sale Service Quality
b. Organizational factors which comprises of Top Management Support and User Training
c. Librarians' factors which comprises of Computer Self-efficacy and Librarians' Experience
2. Which other factor(s) aside the three above is/are responsible for the adoption of your ILMS?

Responding to the first interview question under the research question one, all of the 25 respondents confirmed that their libraries have adopted the various types of ILMS highlighted in the background to the study of this research as captured in Table 3 thereby confirming the researcher's previous field survey of whether the libraries had adopted an ILMS or not. For the factors responsible for adoption, the aggregated responses revealed that "system quality", "information quality", "technical support quality", "top management support", "user-training" "Librarians' computer self-efficacy", "previous experience", "sustainability", "license renewal and support", "after sales service", "consortium", "relevance to the institutional goal", "compatibility with MARC format", "library policy", "users interest", "technical support", "web presence", "international support", "environmental factors", "cost" and "the library's budgetary allocation" were responsible for adoption of their current ILMS.

Research Question 2: What is the influence of technological factors on adoption of ILMS by university libraries in Nigeria?

To answer this research question, the researcher asked the following interview questions;
1. How influential is technological factors to the ILMS adoption in your library?
2. When considering the System Quality of your ILMS, what system quality traits were taken into account?

3. When considering the Information Quality of your ILMS, what information quality traits were taken into account?
4. When considering the Technical Support Quality (After Sale Service Quality) to be given by the company or vendor of your ILMS, what technical support traits were taken into account/ensured?

The 25 respondents indicated that technological factors were very germane to adoption of ILMS in Nigerian university libraries and that considerations were made to ensure that ILMS adopted were of good quality. The synthesis of responses for the systems quality questions revealed that "ease of use", "ease of learning", "systems reliability", "quick response time", "systems flexibility", "robustness", "interactivity", "interoperability", "stability", "free integration", "online and offline security", "friendly interface", "reports and statistics generation", "interlibrary loan features", "MARC 21 format" and "Z39.5 compatibility" were the features considered for system quality of ILMS when the systems were been adopted.

Cumulation of responses from content quality of the ILMS question indicated that issues considered for content quality of ILMS among Nigerian university libraries were "understandability", "accuracy", "conciseness", "completeness" and "timeliness of the information provided as output" "meta-searching", "info-station for retrospective conversion in case of migration to a new system" and "manipulability" of the ILMS.

As far as technical support quality was concerned, respondents answered that "provision of accurate service", "provision of dependable service", "technical competence", "having users' best interests at heart", "knowledge of ILMS technical support staff to do their job well", "backup capability", "durability" and "proximity of the technical person to the university" were the features ensured. Answer under this interview question could be summarized as accuracy, reliability, technical Competency, empathy, assurance and closeness of technical support team.

Research Question 3: What is the influence of library factors on adoption of ILMS by university libraries in Nigeria?

The researcher in order to answer this research question posted the following interview questions to the respondents;
1. How influential is library factors to the ILMS adoption in your library?
2. When considering the top management support for your ILMS, what top management support traits were taken into account?
3. When considering the user-training as a precursor for the adoption of ILMS, what user training qualities were taken into account?

Part of research question one responses had confirmed that the library factors played a major role in determining adoption of ILMS in Nigerian university libraries and it revealed that top management support and user-training were the two major issues to be considered. To therefore confirm the influence of library factors on ILMS adoption in Nigerian university libraries based on research question three, aggregated responses from the 25 respondents revealed that the libraries relied on "Management's awareness of the benefits that can be achieved with the use of the system", "Management's support and encouragement for the use of information systems for job-related work", "Management's provision of most of the necessary help and resources to enable people to use the system" and "Management's provision of good access to hardware and software resources when people need them" as indications of top management support before adoption of ILMS.

The aggregated responses for user-training traits ensured revealed that "trainings were given before but not to the right persons", "not timely" "senior officers were selected at the

expense of their junior colleagues who are actually the users of the system" and "trainings were not adequate". Respondents equally added that user-training was a very important aspect of library factor on ILMS adoption.

Research Question 4: What is the influence of Librarians' factors on adoption of ILMS by university libraries in Nigeria?

Having confirmed in the research question one that Librarians' factors equally plays a role in the adoption of ILMS, the following interview questions were put to the respondents to find out how influential is this factor;

1. How influential is Librarians' factors to the ILMS adoption in your library?
2. When considering the Librarians computer self-efficacy for your ILMS, what were the points taken into account?
3. When considering the Librarians' previous experience before adoption of your ILMS, what were the issues taken into account?

The 25 respondents revealed that "Librarians' factors were highly influential" and that both "computer self-efficacy" and "previous experience of Librarians" were taken into consideration when adopting their respective ILMS. In considering the Librarians' computer self-efficacy, "the level of understanding of Librarians about operating the system", "the confidence level of Librarians about operating the system before adopting it", "the assurance that Librarians would be able to use the system on their own", "the assurance that they would be able to use the system with little or no supervision" and "assurance that Librarians have the required skills" were the main factors considered before the libraries adopted their various ILMS.

The 25 respondents equally gave useful answers in respect to issues considered about the previous experience of the Librarians. Some of the responses were that the Librarians have "experience in using the various types of Information Systems", "experience in using utility software such as Microsoft applications", "participated in feasibility studies", "participation in requirements analysis", "understand and have experience working with computer programming languages", "participation in design of the computerized information systems" and "participation in test running of the system".

Research Question 5: What are the types of ILMS adopted by Nigerian university libraries?

The aim of research question five was to find out the types of ILMS adopted by the libraries, what informed their decision, the advantages each library believed its ILMS has over other ones and equally to find out their opinion about the success of the ILMS in their libraries. To achieve this, the researcher asked the following four questions;

1. What type of ILMS is in use in your library?
2. What in your opinion informed your decision to adopt that type of ILMS?
3. What advantage(s) in your own view do your ILMS has over others in use in other universities?

Though the first item under this research question seemed to have been answered in the preliminary study of this work where the researcher had determined if these libraries had adopted an ILMS. The researcher believed it was better the study confirmed from the professionals in the libraries. Responses gathered from the 25 librarians interviewed revealed that the types of ILMS in Nigerian university libraries were broadly divided into two types of 'subscription/vendor/proprietary based' and 'free/open source' systems.

Subscription/vendor/proprietary based software accounted for sixteen (16) and free/open source software accounted thirteen (13) totaling twenty nine (29). The third

category of software which is a private (individual or jointly developed and used by different universities-Consortium/Library Cooperation Software) was not currently available in Nigeria based on the responses from the 25 systems librarians interviewed.

Reasons considered for adopting free/open source systems by the libraries that adopted it based on the responses of the 25 librarians interviewed revealed that "the system's ease of use", "provision of interactive features between users and systems", "universality", "free and ability to customize it to suit their requirement", "financial freedom", "robustness", "flexibility" and "maintenance effectiveness" were the factors. While those who adopted subscription/vendor/ proprietary software responded that "acceptability of the software worldwide", "technical support", "dependability", "recommendation by the supporting agencies", "access to support services", "ability to add local contents", "flexibility", "wide community of users", "meeting international standard" and "easy upgrading" were their reasons for adopting.

Research Question 6: What are the factors responsible for migration by Nigerian university libraries from one ILMS to the other?

To answer this research question, the researcher posted the following interview questions to the respondents;

1. Have you ever migrated from ILMS in this library before?
2. What in your opinion is responsible for the migration?
3. Do you agree to the fact that if the adoption of the former ILMS was influenced by the technological factors of the system, organizational factors of the library and Librarians' experience factors, the system would have last longer in your library and might have been sustained?
4. Does your library consider the factors mentioned in the above question before considering this new system?

Twenty two 22 (78.6%) out of the twenty eight (28) libraries surveyed have once migrated from one system to another according to their responses. Factors responsible according to responses of the 25 interviewees included "quest for a more robust ILMS", "lack of vendors' support service", "software malfunctioning", "non-flexibility and non-integrative of the previous system", "quest to capture more data", "quest to adopt a web based system", "operating system issues (for instance from DOS to Windows)", "failure of the previous system", "cost (finance)" and "compatibility".

Research Question 7: What are the ways of minimizing failures in the adoption of ILMS in Nigerian university libraries?

The researcher asked the following four interview questions to deal with research question number seven;

1. Have you ever observed that failures have been rampant in the adoption of library software in Nigerian university libraries?
2. As the head of the library/Systems Unit, why do you think this scenario persists?
3. How can we minimize failures in the adoption of ILMS in Nigerian university libraries?
4. Please comment freely on how to improve on adoption pattern and use of ILMS in Nigerian university libraries.

Only the systems Librarians at University of Jos claimed 'not sure' about the fact that failure in the adoption of ILMS was rampant among Nigerian university libraries. Other respondents agreed to this fact. Factors that might be responsible for such as gathered from responses included "technical know-how", "naivety of university librarians on spending

money on good integrated library management systems", "new developments in technology", "Lack of proper planning for automation", "lack of support from university Management", "expensiveness of the proprietary software", "poor technical support", and "epileptic power supply".

Others were "lack of proper feasibility study", "change in library Management", "finance", "not much time for test-running the software before adoption", "the desire to follow bandwagon without evaluating the library's needs first", "non-availability of solid maintenance agreement", "not considering the size of the library vis-à-vis the capacity of the system", "lack of expertise work force", "general infrastructural problem" and "corruption" as far as some university Librarians are concerned.

To minimize the failures regarding adoption, librarians suggested that the aforementioned problems should be critically looked into while efforts should be exerted at bypassing all the obstacles before adoption. Respondents equally suggested consortium building since most Nigerian university libraries shares common characteristics, using a system that is unified among them will limit most of the highlighted challenges.

Other suggestions were "competence based training", "funding", "employment of competent hands to man the e-library", "knowledge sharing", "involvement of staff at the planning stage", "putting necessary infrastructure in place", "collaboration", "encouraging local software developers", "needs assessments be carried out", "awareness services", "vendor reputation", "software popularity" and finally "strong consortium should be formed among universities".

Discussion

The first specific objective of this study was to identify factors considered by Nigerian university libraries before adopting ILMS. This objective was fulfilled through oral interview responses and the research question which was asked to ascertain if the Nigerian university libraries considered technological, library and Librarians factors before adoption of ILMS. Results confirmed the fact that Nigerian university libraries actually considered these factors literally as the overall summary of responses pointed towards that.

Though most of the systems librarians were not categorical in their responses, as some of them asked the interviewer what the researcher meant by technological, library and librarians' factors, further explanation by what the researcher meant about technological (these are the issues relating with the quality of the ILMS such as usefulness, ease of use, content and output quality and others), library factors (issues relating with preparedness and support of the management in the ILMS adoption project and others) and librarians' factors such as computer self-efficacy and previous experience shed more light and they agreed that those traits as explained were duly considered when adopting their ILMS . Some respondents particularly those that were using free resources added that the cost of subscription based software made their libraries to adopt free ILMS due to the fact that the libraries' budgetary allocation cannot accommodate the purchase and maintenance of the subscription based systems.

In the bid to find out which of the technological factors were considered by libraries in Nigerian universities when adopting ILMS, the second objective was set. Result reveals that the system quality, content quality, support service quality were the main issues. Each of these ILMS quality factors were equally influenced by certain variables. The system quality was influenced by the system's ease of use, ease of learning, systems reliability, flexibility, robustness, interactivity, interoperability, stability, quick response time, free integration, online security, friendly interface, reports and statistics generation, inter library loan facility, MARC 21 format and Z39.5 compatibility.

The research question number three was stated to fulfil part of the second objective of this study which was to establish the influence of library factors on adoption of ILMS in Nigerian university libraries. Findings suggest that library attributes play major role in determining the adoption of ILMS in Nigerian university libraries. Two major variables were found to influence the library factors. First is the Top Management support (i.e. key Management personalities like the Vice-Chancellor, University Librarians, Registrar, Bursar, Director of ICT and related units in the universities, Professors and senior members of the universities who constitutes the Library Committee). Their support is influenced by their awareness about the inherent importance of the system, supports and encouragement, provision of resources and funding.

The objective four was raised to determine the influence of Librarians on ILMS adoption and research question four was eventually raised to fulfil this objective. Findings ascertained the fact that Librarians do influence their libraries adoption of ILMS. Systems Librarians who were interviewed revealed that their various libraries considered the Librarians' computer self-efficacy (i.e. ability of the Librarians to use computers with little or no hindrance) and past experiences of the Librarians about ILMS when deciding to adopt their ILMS. The libraries that have adopted ILMS ensured that the Librarians were able to use computers and utility software such as Microsoft word and operating software such as windows and databases. They equally ensured that the Librarians were experienced while those who were not experienced were put up for trainings both in-house and outside. They also ensured that their Librarians participated in the requirement analysis, the design and test running of the system.

This study sought to find out what were the types of ILMS adopted by Nigerian university libraries and promptly asked the research question 5 which was answered by interview response from the Systems Librarians. Results show that two out of the three types of ILMS available are currently being adopted in university libraries in Nigeria. They are the subscription/proprietary and free and open access (FOSS) systems. The third which is an in-house/consortium developed by contributions from/of different universities were not in existence. Currently, VIRTUA, Millenium, ITS, SLAM, Liberty, CDS/ISIS, Alice for Windows, Greenstone and Koha (making total of nine) are the systems that are currently being used in Nigerian university libraries. The others, aside Koha, are subscription based which requires annual subscription/renewal fees while Koha is absolutely freely downloadable for use.

The objective six was aimed at identifying factors responsible for migration from one library software to the other by Nigerian university libraries and to achieve this objective, 'What are the factors responsible for migration by Nigerian university libraries from one library software to the other'? was set as the research question.

Results indicate that 22 of the 25 systems Librarians confirmed their libraries have migrated to a new system at least once and that issues responsible for this stems out of the technological factors of the system (especially the system and content quality) and the library factor (especially funding).

Theoretical Implications

This study added to the body of literature in the area of information system adoption and usage. The model for ILMS adoption viewed libraries as single unit of analysis as far as adoption of integrated library management system is concerned. Hence, evaluating phenomenon surrounding libraries as a unit in any university system has been made possible.

This study discovered that the funding pattern of the library was equally a major congruent of behavioural intention to adopt ILMS in Nigerian university libraries because of

its high tendency to influence timely and type of ILMS to be adopted, hence, the study extended the management information systems adoption by organisations (MISAO) which only had three variables viz; technological, organizational and peoples' characteristics.

The resultant model of Integrated Library Management System Adoption (ILMSA Model) is presented and discussed as follows;
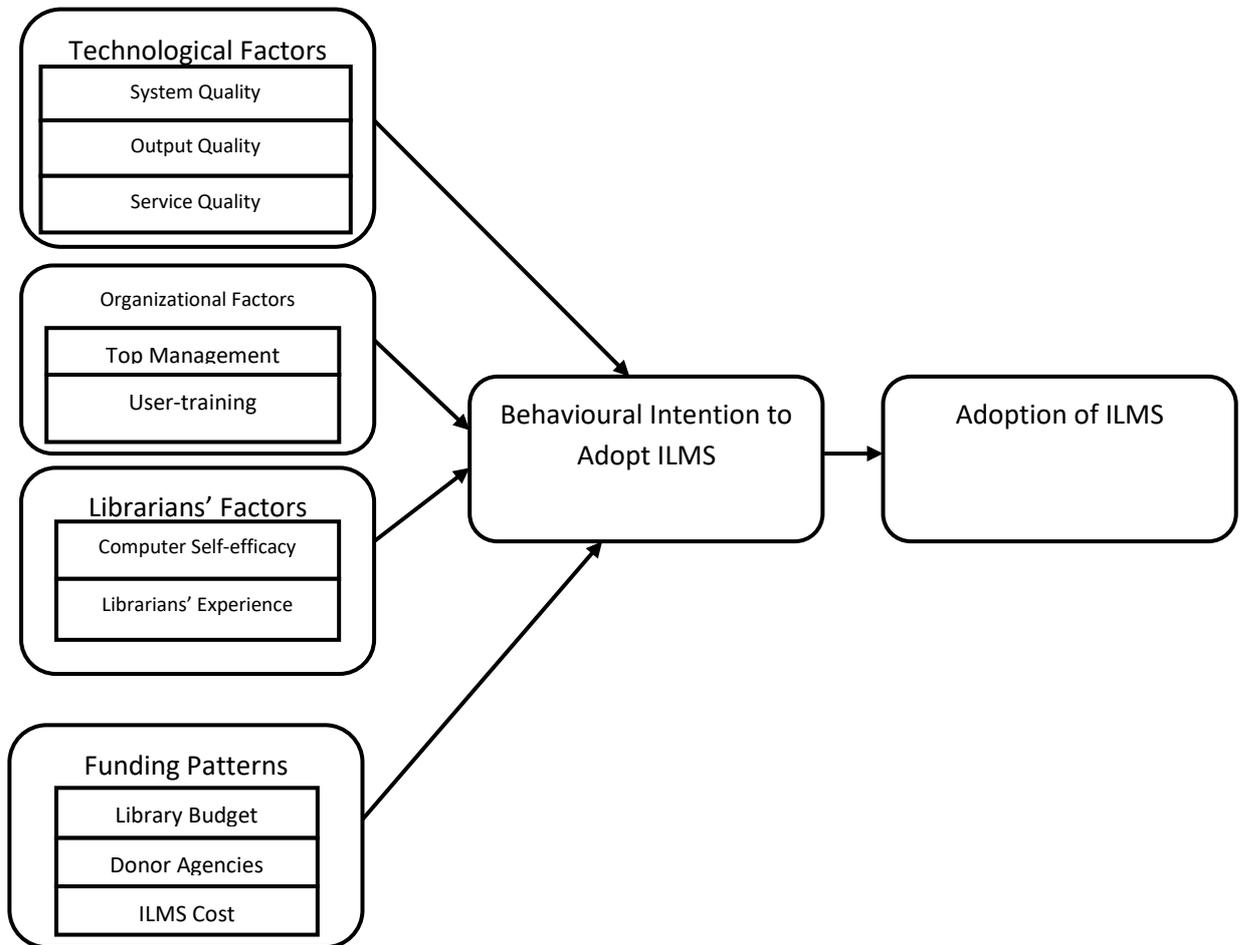
Figure 2: ILMS Adoption Model

An insight into the diagrammatic presentation of the new model indicates that there are four major factors that influence adoption of information systems in libraries. First are the technological factors, the second variable is the library factors, the third variable is referred to as librarians' factors and is measured by two constructs and the fourth is the fourth variable is termed funding pattern.

Conclusion

All libraries adopt ILMS with the aim of automating routines hitherto carried out manually and to ensure speedy and accurate information gathering and dissemination. The process of ILMS adoption however begs for documentation. This study has established that main factors considered by Nigerian university libraries before adopting ILMS are technological, library, librarians' factors and funding pattern of the library. Proprietary/Subscription based and open source softwares were the two types of ILMS

adopted by Nigerian university libraries and factors responsible for migration by Nigerian university libraries from one library software to the other were predicated on technological and library factors. Ways of minimizing failures in the adoption of ILMS in Nigerian university libraries is to consider the adoption factors (technological, library, librarians' factors and funding pattern) critically.

Recommendations

Based on the findings, the following recommendations are made:

1. Adoption policy of ILMS based on technological, library and librarians' factors and funding pattern should be formulated by Nigerian university libraries.
2. Libraries should form consortium to share information and experiences about adoption in order to encourage other libraries to follow suit.
3. Vendors of library software should work hand-in-hand with management of libraries in order to ensure ILMS that will take care of their needs are developed.
4. University Management should provide enough funds to drive the ILMS adoption and support the Library in its bid to automate the library while the University Librarians and other stakeholders in the library should develop advocacy and lobbying skills to attract funds into the library.
5. Alternative power supply such as solar power, battery inverter and any other one that could serve as an alternate or backup for the electricity power supply should be provided by the university libraries in order to ensure maximum use of the systems.
6. As far as funding is concerned, it has been confirmed that it is in fact the most important factor to the considered before adoption of ILMS could be successful, libraries with small budget can look towards international support from donor agencies for support.

References

Adegbore, A. M. (2010). Automation in two Nigerian University libraries. *Library Philosophy and Practice*. Retrieved 25/01/15 from
http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1442&context=libphilprac

Adogbeji, O. B., Onohwakpor, J.E. & Syvester, A. O. (2007). Software selection and acquisition in Nigerian university and special libraries: the way forward. *Computing and Information Systems Journal,* 11(1), 11-18.

Agboola, A.T. (2000). Five decades of Nigerian university libraries: a review. *Libri*, 50(1): 27-34.

Akpokodje, N. V. & Akpokodje, T. E. (2015). Assessment and evaluation of Koha ILS for online library registration at University of Jos, Nigeria. *Asian Journal of Computer and Information Systems,* 3(1), 20- 27

Alabi, G.A. (1987) Computer usage in Africa: trends, problems and prospects. *Nigerian Library and Information Science Review*, 5 (1& 2), 1-6.

Al-adaileh, R. M. (2009). An evaluation of information systems success: a user perspective - the case of Jordan Al-adaileh telecom group. *European Journal of Scientific Research*, 37(2), 226-239.

Al-Mamary, Y. H., Shamsuddin, A & Aziati, N (2014). Management Information System Adoption by Organizations (MISAO) Model. *American Journal of Systems and Software*, 2 (5), 121-126

Ayankola, I. A. (2012). The challenges and frustration of software adoption in Nigeria libraries: a survey of some selected libraries, *Library Philosophy and Practice (e-journal) Paper 856.* Retrieved 25/01/15 from http://digitalcommons.unl.edu/libphilprac/856

Eguavoen, E. O. L. (2011). Attitudes of library staff to the use of ICT: the case of Kenneth Dike Library, University of Ibadan, Nigeria. *Ozean Journal of Social Sciences* 4(1), 1 – 9

Kiriyanant, P. (2012). *Survey of open source integrated library system in Thai university libraries in Bangkok and Pathumthani.* Kyoto : The Library of Center for Southeast Asian Studies, Kyoto University.

Lai, J. & Chang, C. (2010). User attitudes toward dedicated e-book readers for reading: The effects of convenience, compatibility and media richness. *Online Information Review,* 35(4), 558-580

Laukkanen, S., Sarpola, S. & Hallikainen, P. (2005). ERP system adoption. Does the size matter? *Proceeding of the 38th Hawaii International Conference on System Science.*

Nebeolise, L. N. & Osuchukwu, N. O. (2014). Issues in selecting appropriate software for automation and management of academic libraries in Nigeria. *International Journal for Innovation Education and Research*, 2(10), 32-47

Nok, G. (2006). The challenges of computerizing a university library in Nigeria: the Kashim Ibrahim library, Ahamadu Bello University, Zaria. *Library Philosophy and Practice*, 8(2), 1-7.

Ogunleye, G. (1997). Automating the federal universities libraries in Nigeria a state of the art. *African Journal of Library, Archives and Information Science* 8(1), 71-79.

Ogunsola, L. A. (2005). Nigerian university libraries and the challenges of globalization: the way forward. *Journal of Social Sciences,* 10(3) 199-205

Okewale, O. & Adetiminrin, A. (2011). Information use of software packages in Nigerian university libraries. *Journal of Information Technology Impact*, 11(3), 211-224.

Okiy, R. B. (1998). Nigerian university libraries and the challenge of information provision in the 21st century. *Library Bulletin: Nigerian University Library System*, 3(1&2), 17-28.

Panopoulos, A. P. & Sarri, K. (2013). E-mentoring: the adoption process and innovation challenge. *International Journal of Information Management,* 33(1), 217-226

Petter, S., DeLone, W., & McLean, E. R. (2013). Information systems success: the quest for the independent variables. *Journal of Management Information Systems*, 29, (4), 7-61.

Rochtanek, T. R. & Matthews, J. R. (2002). *Library information systems: from library automation to distributed information access solutions.* Connecticut: Libraries Unlimited.

Sadeh, T. & Ellingsen, M. (2005), Electronic resource management systems: the need and the realization, *New Library World*, 106 (12), 208-218

Singh, V. (2013). Experiences of migrating to an opensource integrated library system. *Information Technology and Libraries,* 32(1), 36-53.

Spanos, Y. E., Prastacos, G. P. & Poulymenakou, A. (2002). The relationship between information and communication technologies adoption and management. *Information and Management,* 39(8), 659-675

Uzomba, E. C., Oyebola, O. J. & Izuchukwu, A. C. (2015). The use and application of open source integrated library system in academic libraries in Nigeria: Koha example. *Library Philosophy and Practice,* Online Retrieved 25/01/16 from http://digitalcommons.unl.edu/libphilprac/1250/

Wang, Y. C. W., Chang, C. & Heng, M. S. H. (2004). The level of information technology adoption, business network and a strategic position model for evaluating supply chain integration. *Journal of Electronic Commerce Research,* 5 (2), 85-98