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The Experience of Using Virtua Integrated Library System in Nigerian University Libraries

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ABSTRACT

The paper explores the experience of using Virtua Integrated Library System by some university libraries in Nigeria for automating their operations throughout a decade. It also accounts for the challenges encountered by the libraries and reveals their switch over to other software. Survey method was used to collect data from systems' staff and librarians of the six universities that adopted Virtua software via self-distributed online questionnaire. Purposive sampling technique was employed to select the respondents. The findings revealed that majority of the libraries used Virtua for years more than any of their previous software. The initial source of funding the software and staff training was provided by the Carnegie Corporation and MacArthur Foundation. The modules implemented by the libraries include cataloguing, circulation, administration and Online Public Access Catalogue (OPAC) and serials control and acquisition were partially used. The system was friendly used by the university libraries with few challenges which included increase in subscription fees. At different periods of few years back, the libraries dropped the software and switched over to Koha and locally developed library system respectively. It is recommended that the University Management of the libraries should provide adequate funds to enhance the implementation of library automation software.

Introduction

The implementation of library automation software in university libraries in Nigeria has created a paradigm shift from traditional practice of services delivery to automated system in order to attain international best practices and standards.

For Nigeria Universities to improve on teaching, learning and research activities in line with global best standards, their libraries have resorted to adopt library automation software with international backgrounds. This has made many universities to adopt different foreign integrated library systems to automate their library operations with migration experience of success story and challenges. Many studies had revealed that migration from one library automation system to another as from proprietary software to free open system has become a common practice in libraries worldwide to date (Wang, 2009; Imo & Igbo, 2011; Adamu, Ibrahim, & Gbaje, 2020).

Over the years, the adoption of library automation software packages had been subject to remarkable changes in some university libraries in Nigeria.

In 2008, the Carnegie Corporation gave the Mortenson Center for International Library Programs at the University of Illinois a second grant to assist university libraries in East and West Africa with their automation projects. The Corporation selected Obafemi Awolowo University and University of Jos in Nigeria among other four universities in Ghana, Tanzania and Uganda to benefit from the grant respectively. During this same period, the MacArthur Foundation also funded the Mortenson Center to work with four additional university libraries in Nigeria. The university libraries include Ahmadu Bello University, Zaria, University of Ibadan, Bayero University, Kano and University of Port-Harcourt (Mortenson Center, 2012).

This report reveals that six Universities in Nigeria were selected to benefit from the library automation grants of the Carnegie Corporation and the Mac Arthur Foundation respectively.

In Nigeria, the six university libraries selected Virtua Integrated Library System after feasibility study and vendors' presentations. The support of the Carnegie Corporation and MacArthur Foundation has had a profound impact on the automation project in the six university libraries.

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The past ten years of Virtua software in Nigeria have been an incredible journey with many successes and difficulties as experienced by the participating libraries.

In 2018, majority of these university libraries had started preparing to switchover from Virtua software as being a proprietary system to free open source system as its license renewal rate increased beyond the financial capacity of their parent institutions. This was due to the ownership change of the software from its original company known as VTLS to another Innovative Interfaces Company, which acquired the Virtua in 2014 (Breeding, 2017). The university libraries have used the Virtua integrated library system over the years more than any of their previous library automation software implemented individually. Proprietary library automation software solutions have started departing from the Nigerian market as majority of academic and special libraries are migrating from their legacy automation software to Koha Integrated Library System.

Statement of the Problem

Many university libraries in Nigeria had experienced the adoption of local and foreign library automation software for automating their operations. Such library software did not witness long duration for proper implementation due to financial, administrative and technical problems encountered by the libraries (Adegbore, 2018). This had made the university libraries to switch over from one system to another as usual trends in many academic libraries around the world.

Virtua was a library automation system developed by VTLS and it was the only software for the first time the university librarians were fully involved in its selection with a team set up for extensive deliberations. It is a proprietary library system adopted by many academic, special and public libraries around the globe for many decades. The software was properly studied and finally selected by the six university libraries in Nigeria. The international standard and acceptability of the software had been experienced by the participating university libraries for the number of years of using it. The university libraries used the software for more than one decade and it was the first system that stayed long with the participating libraries before their recent transition to open source software. It is against this background that the study explores the experience of using the Virtua Integrated Library System by the six university libraries in Nigeria. Also, the study highlights the level of implementing the software and the switchover to Koha open source software. Therefore, there was a need to conduct this research to account for the success story and challenges experienced by the university libraries implemented the software.

Research objectives

The study was mainly conducted to explore the experience of using Virtua Integrated Library System by six University Libraries in Nigeria.

The study had the following specific objectives:

1. To examine the implementation of Virtua software in the six University Libraries in Nigeria.
2. To find out the challenges encountered by the six university Libraries in using Virtua software prior to their switchover to other software.

Review of related literature

Historical development of Virtua software

Virginia Tech Library System (VTLS) Inc. located in Blacksburg, is the offspring of a project launched in 1974 at Virginia Polytechnic Institute and State University's Newman Library. The Virginia Tech initiated a project to develop an automated library system. The Online Public Access Catalogue (OPAC) and automated circulation system developed by VTLS were installed at Virginia-Tech's Newman Library in 1975. By 1985, the software had grown into the integrated library system known as VTLS. In the same year, the VTLS was granted worldwide rights to market its products (Husain & Ansari, 2008).

In 1998, VTLS Inc. (Visionary Technology in Library Solution) introduced Virtua Integrated Library System for automating the entire library traditional operations. The VTLS received an ISO 9001 certified company. Significantly, more than 1000 libraries in 40 countries have chosen Virtua software for automation purpose (VTLS, 2013).

VTLS developed its third generation system, Virtua, with the goal of creating a radically different system designed to automate a library in a distributed, multimedia operating environment. Virtua works on Windows 2000, so all staff PCs had to be upgraded to Windows 2000 prior to training and practice. The software is the first Unicode-compliant ILMS, the first to incorporate functional requirements for bibliographic records (FRBR) functionality and the first to support Resource Description and Access (RDA) implementation (VTLS, 2013).

The system has modules available in the six functional areas of acquisitions, cataloguing, serials control, circulation, reference and information services, and online public access catalogue. Virtua has been globally adopted by academic, public and special libraries in some developed and developing countries due to its well-developed features and functions. The characteristics, core features and functions were significantly studied and compared with other open source and proprietary software packages in different countries of the world by many researchers. For example, Uma, Suseela, and Kalyani (2014), Siddique and Mahmood (2015), Singh (2015) and Madhusudhan and Singh (2016) examined the modules of Virtua and compared its features with other library automation software packages (Alice for Windows, Koha, Libsys and NewGenLib) adopted by academic libraries and the findings revealed that the Virtua software was internationally accepted for library automation and digital library and highly rated above other software in use.

Virtua Integrated Library System in Nigeria

In Nigeria, University and some special libraries took a lead step ahead of other types of libraries in automating their services and a number of foreign as well as indigenous proprietary library automation software packages are being used (Adogbeji, Nwalo, Okonoko, & Toyo, 2013). The six university libraries under study have one way or the other experienced the utilization of automation software packages prior to their migration to Virtua software. But the scenario was not encouraging due to unavoidable obstacles of administrative, financial, operational, and technical issues. The automation project in these university libraries was the opportunity presented by the World Bank project organized and executed by National Universities Commission (Imo & Igbo, 2011).The University of Ibadan adopted Alice for Windows to automate its operations prior to implementation of Virtua Integrated Library System in 2009 (Otulugbu, Omoike, & Agwu, 2019).

The Ahmadu Bello University Library also migrated from Alice for Windows to Virtua integrated library system in 2008 (Ibrahim, Ikwe, & Abdussamad, 2020). Similarly, the Bayero University Library acquired Alice for Windows to automate its operations for effective service delivery and migrated to Virtua software in 2008. The Obafemi Awolowo University Library used TINLIB software for automating its operations and migrated to Virtua software in 2008 (Bassey, 2016; Otunla, 2016).

The university of Port Harcourt library commenced its automation project in 2006 using a trial version of bibliophile cataloguing software from The Library Corporation (TLC). The software was only developed for creating bibliographic records using Machine Readable Catalogue (MARC) cataloguing standards. The library migrated from this software to Virtua Integrated Library System in 2009 (Edet, 2020).

The University of Jos Library adopted the Integrated Technical Services (ITS) proprietary software from the Library of Congress (TLC) for Windows Cataloguing Module of Library Management System in 2001. The library migrated from the software to Virtua ILS in 2010 (Akpokodje

& Akpokodje, 2015). The six university libraries experienced a moderate turnover rate of adopting library automation software before the opportunity of Virtua software was adopted in 2008 (Adogbeji et al., 2013).

In 2008, the Carnegie Corporation gave the Mortenson Center for International Library Programs at the University of Illinois a second grant to assist university libraries in East and West Africa with their automation projects. The Mortenson Center worked with library administrators to identify an excellent system that met current world-wide standards for libraries. Three systems were reviewed and evaluated. The systems are Millennium Integrated Library System, Virtua Integrated Library System and Adlib Information systems (Mortenson Center, 2012).

The Corporation selected Obafemi Awolowo University and University of Jos in Nigeria among other four universities in Ghana, Tanzania and Uganda to benefit from the grant respectively. During this same period, the MacArthur Foundation also funded the Mortenson Center to work with four additional university libraries in Nigeria. The university libraries include Ahmadu Bello University, Zaria, University of Ibadan, Bayero University, Kano and University of Port-Harcourt (Mortenson Center, 2012).

At this point, it is noted that Virtua as an internationally recognized system for major research libraries was selected by Makerere University in Uganda, University of Education, Winneba in Ghana and the six university libraries in Nigeria.

In Nigeria, the six university libraries selected Virtua Integrated Library System after feasibility study and vendors' presentations. The support of the Carnegie Corporation and MacArthur Foundation has had a profound impact on the automation project in the six university libraries. Librarians and systems staff of the libraries received local and international Virtua trainings from the Mortenson Center for International Library Programs at the University of Illinois. The VTLS provided Virtua Training Manuals and Videos to the participating university libraries to facilitate its implementation. Throughout the years of Virtua software in these university libraries, monthly progress and annual assessment reports were sent to the VTLS and Mortenson Center to check their successes and challenges.

The Mac Arthur Foundation and Carnegie grants were initiated to cover the first five years of funding the Virtua software project in the six university libraries in Nigeria. The license was for an initial five years after which it was renewed by the universities themselves for another five years (Mortenson Center, 2012).

The past ten years of Virtua software in Nigeria have been an incredible journey with many successes and difficulties as experienced by the participating libraries. Their individual automation progress with the software was accomplished due to the dedicated work and commitment of many university librarians and their staff. This software had enabled the university libraries to form VTLS User Group in Nigeria for sharing ideas and maintaining uniformity. It also facilitated their ways to attend the VTLS User Group meetings and trainings in Europe and United States of America with the support of Mortenson Center for International Library Programs (Breeding, 2017).

Nigeria was fortunate to have six public universities that adopted the Virtua software when compared to other countries in Africa. The libraries adopted the software for the fact that it is well supported and implemented by many other libraries around the globe with the hope of joining a user group to support common problems and offer solutions that would lead to continuing improvements.

Globally, the Virtua software is almost perfect, but it has been acquired by Innovative Interfaces Incorporate in 2014 and its ownership has shifted from the VTLS (Breeding, 2017).

Methodology

The survey design was chosen for this study using the questionnaire to collect data on the experiences of six federal university libraries adopted Virtua Integrated Library System for automating their operations. The libraries were purposively used as the only Virtua users in Nigeria. A total number of two systems staff and four librarians were randomly selected from each of the six university libraries with a grand total of thirty six (36) respondents.

The questionnaire was a self-developed instrument and it was examined by four members of Virtua User Group in six University Libraries in Nigeria in January 2021. Their email contacts were used for this purpose and their comments were received and used to modify the instrument prior to the data collection. Appendix I consists of a copy of the questionnaire distributed.

A structured questionnaire was emailed to the systems staff and librarians with working experience of Virtua software in the university libraries in April 2021 and their responses were promptly received. Data collected were analyzed using frequency distribution.

The university libraries were located in three geopolitical zones in Nigeria with the establishment status of first and second generation universities. These universities are presented in the following table (Table 1).

The table reveals that the six universities that adopted Virtua software comprise of three first and three second generation universities in four geopolitical zones in Nigeria. This combination would serve a good model for their same generation and other generation universities in automating their library operations. These universities were properly identified as Virtua Users in Nigeria and globally recognized among VTLS User Group. The university libraries experienced national and international user group trainings and meetings for deliberation and knowledge sharing.

Presentation of results

The results of the study were presented in the following Tables 2-7 respectively.

The table reveals the categories of participants who responded to the questionnaire. The respondents included twelve (12) systems staff and twenty four (24) librarians from the six University Libraries. The implementation of library automation software involves the systems staff and Librarians in the libraries. All the respondents significantly participated in filling and submitting the electronic survey (Tables 2, 3).

The table reveals that four university libraries received the grant of MacArthur Foundation and other two libraries got the grant of Carnegie Corporation to improve their automation project respectively. The finding also reveals that all the libraries commenced the implementation of Virtua in 2008, 2009 and 2010 respectively. The migration of the software by the six University Libraries was recorded throughout 2013 to 2020. This implies that the libraries have used the foreign grants for automating their operations. The Virtua Version 2009.3.3 was generally used by the libraries as indicated by all the respondents (Table 4).

The table reveals that systems staff and Librarians of the six libraries attended Administration, Cataloguing, Circulation and OPAC module trainings respectively. Librarians of two libraries received in-house training on Serials control module and none of the libraries received training of Acquisition module of the software. This indicates that the systems staff and Librarians were trained on four modules of the software and the implementation was significantly featured on these

Table 1
Virtua user libraries in Nigeria.

S/N	University	Generation	Zone
1	University of Ibadan	First	South West
2	Obafemi Awolowo University	First	South West
3	Ahmadu Bello University	First	North West
4	Bayero University, Kano	Second	North West
5	University of Jos	Second	North Central
6	University of Port-Harcourt	Second	South-South

Table 2
Categories of respondents.

S/N	University library	Category/no of respondents		Total
		Systems staff	Librarians	
1	Kenneth Dike Library, University of Ibadan (KDL)	2	4	6
2	Bayero University, Kano Library (BUKL)	2	4	6
3	Kashim Ibrahim Library, Ahmadu Bello University (KIL)	2	4	6
4	Hezekiah Oluwasanmi Library, Obafemi Awolowo University (HOL)	2	4	6
5	Donald Ekong Library, University of Port-Harcourt (DEL)	2	4	6
6	University of Jos Library (UJL)	2	4	6
	Total	12	24	36

Table 3
Virtua profile of the six University Libraries from 2008 to 2020.

S/N	University library	Original source of funding	Year implemented	Year migrated
1	KDL	MacArthur Foundation grant	2008	2014
2	BUKL	MacArthur Foundation grant	2009	2020
3	KIL	MacArthur Foundation grant	2008	2018
4	HOL	Carnegie Corporation grant	2009	2020
5	DEL	MacArthur Foundation grant	2008	2018
6	UJL	Carnegie Corporation grant	2010	2013

modules. The training was locally and internationally received by some of the systems staff and Librarians of the participating libraries as indicated by the respondents (Table 5).

The table reveals that four modules of the software implemented by the six university libraries include Administration, Cataloguing, Circulation and Online Public Access Catalogue (OPAC).

It is clearly understood that the four modules were vitally featured in the success of a new library management system for services delivery to potential users. The cataloguing was used as a pilot module; all hands were channeled to retro-conversion prior to installation of Virtua.

The Serials control module was implemented by two of the six University Libraries and acquisition module was used by only one university library. This implies that there was no adequate training for library staff on the serials control and acquisition modules which were not used by majority of the participating libraries. In addition, the acquisition module has not been operated due to procurement rules for acquiring library resources (Table 6).

The table reveals that four modules of Virtua (Cataloguing, Circulation, OPAC and Administration) were fully implemented by KDL, KIL, DEL, and UJL. The Serials Control module was partially used by KDL and BUKL, and Circulation module was partially implemented by BUKL and HOL. The OPAC module was partially used by BUKL only and the Acquisition module was also partially implemented by KDL only. The serials control module was not implemented by KIL, HOL, DEL and UJL. The level of implementing the Virtua modules was significant as the core features of Administration, Cataloguing, Circulation and OPAC modules were adequately used by the majority of the libraries. The Serials and Acquisition modules were not adequately implemented by the participating libraries. The full implementation of its modules reveals that core features and functions of the software were fully used by the libraries. The partial implementation of acquisition and serials control modules by the libraries reveals that the features and functions of such modules were not fully used. This implies that full automation was not attained by any of the participating university libraries (Table 7).

The result observed above reveals that inadequate funds to sustain Virtua license and astronomical increase in cost of its renewal are financial challenges encountered by all the participating university libraries. Also, the power outages is an operational challenge encountered by all the libraries and other operational challenges experienced by some libraries include socket error, inadequate facilities for backing up the server and insufficient Internet connectivity. The financial and operational challenges experienced by the six university libraries are clearly observed as the barriers militating against full implementation of the software.

Table 4
Types of Virtua trainings received.

S/N	University library	Frequency of Virtua trainings					
		Administration	Cataloguing	Serials	Acquisition	Circulation	OPAC
1	KDLUI	2	4	4	0	4	4
2	BUKL	2	4	4	0	4	4
3	KILABU	2	4	0	0	4	4
4	HOLOAU	2	4	0	0	4	4
5	DELUP	2	4	0	0	4	4
6	UJL	2	4	0	0	4	4
	Total	12	24	8	0	24	24

Table 5
Virtua modules implemented by the libraries.

S/N	University library	Frequency of Virtua modules implemented					
		Administration	Cataloguing	Serials	Acquisition	Circulation	OPAC
1	KDLUI	6	6	6	6	6	6
2	BUKL	6	6	6	0	6	6
3	KILABU	6	6	0	0	6	6
4	HOLOAU	6	6	0	0	6	6
5	DELUP	6	6	0	0	6	6
6	UJL	6	6	0	0	6	6
	Total	36	36	12	6	36	36

Table 6
Level of Virtua modules implemented.

S/N	Library	Level of Virtua modules implemented											
		Administration		Cataloguing		Serials		Acquisition		Circulation		OPAC	
		Full	Partial	Full	Partial	Full	Partial	Full	Partial	Full	Partial	Full	Partial
1	KDL	6	0	6	0	0	6	0	6	6	0	6	0
2	BUKL	6	0	6	0	0	6	0	0	0	6	0	6
3	KIL	6	0	6	0	0	0	0	0	6	0	6	0
4	HOL	6	0	6	0	0	0	0	0	0	6	6	0
5	DEL	6	0	6	0	0	0	0	0	6	0	6	0
6	UJL	6	0	6	0	0	0	0	0	6	0	6	0
	Total	36	0	36	0	0	12	0	6	24	12	30	6

Table 7
Challenges experienced by the university libraries.

S/N	Challenges	Libraries					
		KDL	BUKL	KIL	HOL	DEL	UJL
1	Inadequate funds to sustain Virtua license	6	6	6	6	6	6
2	Astronomical increase in cost of its renewal	6	6	6	6	6	6
3	Socket error	0	6	6	0	6	0
4	Inadequate facilities for backing up the server	0	6	0	6	6	6
5	Power outages	6	6	6	6	6	6
6	Insufficient Internet connectivity	0	6	0	0	6	0

Discussion of findings

The six University Libraries received the original source of funding the Virtua software from MacArthur Foundation and Carnegie Corporation respectively.

This is in line with the report of (2012) that the MacArthur Foundation and Carnegie Corporation gave the Mortenson Center for International Library Programs at the University of Illinois to improve the automation project in some Nigerian universities. The six universities were pilot sites for the library automation project planned by the MacArthur Foundation and Carnegie to make their libraries attain international standard of automated system. The libraries experienced series of upgrading Virtua software throughout its usage from VTLS Company. The Virtua Version 2009.3.3 was generally used by the six participating libraries and it was robust and web compliant. The libraries utilized the software more than a decade as the implementation commenced in 2008 and 2009 and their switchover was recorded in 2018 and 2020. Mortenson Center

This finding is contrary to the finding reported by Imo and Igbo (2011) that Nigerian University Libraries switched software averagely within five years of use. Also, Adogbeji et al. (2013) revealed that most of the university libraries used a maximum of three years and a minimum of one year since inception of the automation project in Nigeria before their migration to other automation software.

For staff training, some systems staff and Librarians of the six university libraries were trained to implement the software. The finding enhances the report of the Mortenson Centre (2012) that the number of the systems' staff and librarians who have participated in training programs, either at the University of Illinois in United States of America or in their home institutions, have benefitted from the long-term training program focused on the implementation of Virtua software. The librarians and systems staff of the six participating libraries attended local trainings on Virtua conducted by the Mortenson Center staff at Kashim Ibrahim Library, Ahmadu Bello University in Zaria on different occasions. The Center trainers focused on the implementation of Virtua software and they were able to build cordial partnerships with each university and moved forward with training activities and great progress had been recorded in the unique skills of each university library. The libraries were able to form Virtua User Group in Nigeria for sharing knowledge and ideas.

The libraries have implemented Virtua modules at different stages. This finding is in line with the survey of Mortenson Center (2012) which revealed that University of Dar es Salaam in Tanzania implemented cataloguing, circulation, OPAC and administration modules and acquisition and serials modules were not implemented. Similarly, the librarians were using the online catalogue, cataloguing, circulation and serials modules. The acquisition module has not been implemented due to procurement rules in Ghana.

All the libraries have implemented library management systems. However, in some cases not all the modules of the system have been implemented. The participating libraries had experienced the library system with the international standards and also connected to other libraries around the globe for sharing knowledge and ideas. The libraries maintained uniformity in implementing the modules of the software.

The extent level of implementing the Virtua modules shows that the libraries were able to fully use some modules and partially implemented some. This finding is in line with the findings of Bassey's (2016) study which revealed that no Federal and State University Libraries have attained full automation except few private university libraries in Nigeria.

The libraries encountered financial and operational challenges in implementing the software.

The financial challenges include inadequate funds to sustain Virtua license and astronomical increase in cost of its renewal.

The finding is in line with Gbaje and Murtala (2014) who opined that the adoption and implementation of proprietary software is expensive and the budget of most libraries in Nigeria is inadequate. The libraries cannot afford the huge repercussions as a result of frequent switching of Integrated Library Systems. Similarly, Imo and Igbo (2011) reported that the university libraries in Nigeria have a high turnover rate of Integrated Library System.

The libraries planned for dropping Virtua as the new company, Innovative Interfaces Incorporate, purchased the software from the VTLS and it also increased the subscription fees and changed the five year license duration to annual subscription. Virtua, an Integrated Library System gained through the acquisition of VTLS, was acquired by Innovative Interfaces Incorporate in 2014. The company no longer develops or markets Virtua software, and its implementations in libraries are rapidly diminishing from the library technology profile (Breeding, 2017). The VTLS served the university libraries very well, the rising cost of the software associated with the increase in exchange rate necessitated the users in Nigeria to immigrate from the software. Its price is not within the reach of many libraries. All the six libraries were able to pay for the renewal of Virtua's license as the initial five years of the donors expired. But due to the financial constraint of the university libraries and the increase in the annual subscription, the libraries were not capable to cope with the cost of sustaining its license and maintenance cost.

Conclusion

The Virtua has served the participating university libraries in Nigeria very well, to experience international standard in cataloguing practice and web- based Online Public Access Catalogue. It has been a privilege for the Mortenson Center team to work with colleagues in Nigeria for the past several years of using Virtua. The core features of cataloguing, administration, OPAC and circulation modules had been implemented by the majority of the libraries. The serials control module was not significantly used by the libraries and acquisition module was not used by any of the libraries.

The libraries attained success in using Virtua software for more than one decade with minimal technical challenges. The libraries also received moderate support and cooperation from the VTLS Company that hosted the software throughout their usage before it was purchased by the Innovative Interfaces Incorporate in 2014.

The fact is that Nigerian University Libraries studied and used Virtua beyond the average value of its modules and they derived value for resources expended on acquiring the software. The experience of using the Virtua software has enabled the majority of the libraries attain success in switching over to Koha Integrated Library System which is well known as open free source. It is only the library of the University of Ibadan that migrated to in-house developed software for its operations and the switchover was successful. The main reason for this general switch over was inadequate funding to sustain foreign proprietary library system. Also, the acquisition of Virtua software by the Innovative Interfaces Incorporate has contributed to this unprepared migration due to change of subscription policy and license renewal fees. All the participating libraries used VTLS for more than ten years. Virtua has worked well for the libraries and they have worked well for it.

Recommendations

The study has revealed different experiences of the six university libraries regarding the selection, implementation of Virtua software including the challenges encountered throughout the period of its usage. It also reported the switchover of five university libraries to Koha Integrated Library System and one library to locally developed software respectively.

Based on the findings, the following recommendations are proffered:

1. The University Management of the six university libraries that implemented Virtua for more than one decade and switched over to open free software should improve the funding of the library automated system.
2. There is a need for the five university libraries that switched over to Koha to transform their former Virtua User Group to form library consortium with other libraries using the software in Nigeria.
3. The Management of the six university libraries should work hard to fully implement the modules of the current library automation software.

Declaration of competing interest

None.

Data availability

The data that has been used is confidential.

Appendix I

The Experience of Using Virtua Integrated Library System in Nigerian University Libraries

Dear Colleague Librarian,

This survey is designed to seek your opinions on the experience of using Virtua Integrated Library System in your reputable University Library. Participants are enjoined to provide their views accordingly, as much possible, as the responses would be confidentially used for research purpose only.

Thank you for your precious time and kind consideration.

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Virtua Experience Survey

Please help me fill this survey on Virtua Implementation in your Library before the migration.

Profile of Virtua Integrated Library System in your university library

1. When Virtua Integrated Library System was adopted by your library?
2. What is the original source of funding its adoption?
3. When did your library drop the software?
4. What is the name of the present software adopted by your library?
5. Which latest version of Virtua was used by your library before the migration please?

Types of Virtua Trainings Received

6. On which of the Virtua modules did your systems staff and librarians receive the training?
   a. Administration
   b. Acquisition
   c. Cataloguing
   d. Circulation
   e. OPAC
   f. Serials
7. Which of the following trainings was attended by your library staff?
   a. Local training only
   b. Foreign training only
   c. Both

Implementation of Virtua Modules

8. Which of the following modules of the software was implemented?
   a. Cataloguing
   b. Circulation
   c. Acquisition
   d. OPAC
   e. Serials
   f. Administration
9. Which of the above modules are either partially or fully implemented?
10. What were the problems encountered by your library during implementation of the software?

Thank you for your precious time and cooperation
Please send me your response through this email,
mszubair.lib@buk.edu.ng

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