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# WHY AND HOW OF TECHNOLOGY INTEGRATION FOR SERVICES IN UNIVERSITY LIBRARIES?

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## Abstract

*University libraries are expected to provide efficient services to users and this can be facilitated with technology. The technology to be adopted must be such that will benefit both the librarians and the users. For technology to be adopted in a university library, adequate planning must be taken to ensure that the most relevant technology is adopted that will improve the services provided. The planning should include the consideration of factors such as type of technology, perceived usefulness, perceived ease of use, cost and Information and Communication Technology (ICT) skills of librarians. The study investigated the type of technology integrated and factors considered in planning in ten university libraries in South-west, Nigeria using an interview schedule to collect data from a librarian in charge of technology in each of the universities. Results were thematically analysed. Findings revealed that all the university libraries were using software, social media but only four libraries were using Radio Frequency Identification. Perceived usefulness and perceived ease of use were factors considered for technology integration. University libraries have integrated technology for various activities but sustainability of these technologies should be ensured and regular trainings to improve the ICT skills of the library personnel should be done.*

## Keywords

Technology integration; Social media use, University libraries; Librarians; Nigeria

## Introduction

Libraries are established to provide relevant information sources and services to satisfy the information needs of users in an organisation. Services in the library must therefore, be provided to meet the needs of library users (Kibugi, 2013). Libraries cater for the information needs of users through the provision of relevant and current information sources and services. These sources are acquired and organised by library personnel. Information sources and services in a library must be tailored towards fulfilling the goal of every library,

which is to satisfy users' information needs. The type of services provided in the library by the staff therefore, should be focused on users and this subsequently will determine the effectiveness and efficiency of the library towards satisfying users' information needs. Okite-Amughoro (2017) reported that the provision of relevant information by the library will determine the efficiency of the library. Library services are provided by information professionals to meet the needs of users. Many of the library services were previously manually



provided, but with current development globally, it has been observed that information and communication technology (ICT) is being deployed in university libraries to improve service delivery to users.

### **Library Technology: What and Why?**

The need to improve the services delivered in the library has necessitated the adoption of technology. Library technology has changed the type of information resources acquired from solely print to either a combination of print and electronic or entirely electronic. This has also upgraded the type of services being rendered from the traditional or manual way to electronic ways of providing such services. The change in the type of information resources and services has been facilitated through the use of ICT in libraries.

Use of technology in libraries has facilitated access to electronic information materials within and outside the library. It provides access to vast information sources irrespective of time and location. Technology use in libraries also enhances the productivity of library staff as they can attend to more queries of users, market their products, create awareness of the information resources and services, acquire and organise information sources better (through online classification and cataloguing), repackaging of information and communication with users and vendors. Libraries have adopted Web 2.0 technology for their services and presently advanced to the use of Web 3.0 technology. ICT has modified the way information is acquired, organised, stored, retrieved and disseminated in a library, and this has a consequence on library personnel as they

must acquire the requisite ICT skills to key into the use of technology for different library activities (Seena, 2014).

Use of technology in libraries have resulted into the provision of electronic databases, virtual libraries, Current Awareness Service (CAS), Online Public Access Catalogue (OPAC), electronic document delivery, mobile phone service, institutional repositories, digitisation of materials, resource sharing, consortium building and cloud computing.

### **Library Technology and User Services: Relevance and Types**

Technology can be deployed in the library to improve service delivery. Qutab, Bhatti and Ullah (2014) reported the use of technology in public and private universities in Pakistan for webinars, online classification, marketing of library services, indexing and abstracting and current awareness service. This technology has been adopted by library staff to improve service delivery. The use of technology in libraries could be for creation and maintenance of library portal on the web, database and Internet search and retrieval, cataloguing and classification, electronic document delivery, selective dissemination of information and reference services.

With technology, it is easier and faster to catalogue and classify information materials as the library personnel can search online for the class mark and subject descriptors, saving the library personnel the task to do manual cataloguing which may be stressful. Presently, many information materials come with Cataloguing in Publication (CIP) and this has reduced the effort the librarians require to



catalogue a new information resource. Different technologies deployed in libraries are cloud computing, library software, websites creation, social media, wikis, and blogs, Radio-Frequency Identification (RFID) and web conferencing.

Cloud computing is the storing and sharing of resources over the Internet and it has improved the creation, retrieval, dissemination and use of information. It is also acclaimed to reduce library costs such as maintenance of equipment, updating to newer versions of software and hardware as it does not require inquiring costs for new infrastructure and licensing new software (Makori, 2015). Cloud computing can be used for acquisition, cataloguing, metadata storage and retrieval of information materials. It can be used to improve service delivery and ultimately lead to users' satisfaction.

Another technology that is used in the library to enhance the delivery of services to users is library software. Library software are computer instructions that are written by programmers to perform library routine functions such as circulation, cataloguing and classification, reference, acquisition, serial, administrative tasks. Ogbenege and Adetimirin (2013) averred that the adoption of library software is necessary for efficient service delivery to users as they facilitate better organisation of information resources, ease of retrieval, reduces repetitive tasks and improves service delivery. Presently, many library software are integrated, that is the individual modules for different library activities are able to communicate with one another, such that there is elimination of repetitive tasks and this improves service delivery to users.

Web 3.0 technology is advancement over Web 2.0. IGI Global (International Publisher of Information Science and Technology Research) Online dictionary explains Web 3.0 as a service-oriented Web where user participation and collaboration is enabled. The creation of websites for libraries is also a common feature in many libraries as it assists to promote the information resources and services to users. Many libraries have created websites that are regularly updated and maintained to make them functional and relevant in meeting users' needs.

Mahmood and Richardson (2011) reported the high level of use of Web 2.0 technology such as blogs, micro blogs, Really Simple Syndication (RSS), instant messaging, social networking sites, mashups, podcasts, and vodcasts in academic libraries in America. These tools were used for marketing their services, provision of information literacy instruction and information about print and digital resources, sharing news, and communication between library professionals and users.

Another technology that has been adopted in libraries globally is social media. Chitumbo (2015) explained social media as a tool used for communication, information acquisition and provision of quick services to library users such as current awareness services, answering users' queries and user education. Examples of social media are: social networking (Face book, Twitter, LinkedIn, YouTube) wikis, pods, Really Simple Syndication (RSS), social bookmarking and tagging. Social media has been deployed in libraries to improve the services provided by



library and information professional to users. Use of social media by the library in this information age is relevant as many of the library users are currently using one social media or the other and are therefore, familiar with it.

Social media is also used for marketing of library services. In a study by Collins and Quan-Haase (2014) on academic libraries in Ontario, Canada, it was reported that social media is used to market library services. It was also found to be used to create awareness of information resources and services to users and also to reach out to current and future library users. Blogs and wikis were used in libraries to disseminate information and news (Scale and Quan-Haase, 2012).

Social media is not used only in developed countries, but also used in developing countries. Library professionals in South Africa and Zimbabwe use social media for reference and marketing of information products and services (Mabweazara and Zinn, 2016). Kibugi (2013) reported that social media is used for improved communication between library professionals and users in Kenya. Olajide and Alao (2016) affirmed that social media is used for service delivery to users in Nigeria, but the level of use is low. However, the use of social media by the library must be based on the needs of the users to ensure improved service delivery.

Radio Frequency Identification (RFID) is another technology that is used in the library. RFID is a technology "that uses radio waves to transfer data between a reader and an electronic tag which is attached to a particular object" (Singh and Mahajan, 2014 pg 1). The benefits of RFID in libraries include security of library

collection, ease in inventory of library collection and charging and discharging of information materials. This has facilitated its use in libraries in different countries. However, despite the benefits, the challenges affecting its use in Indian libraries are high cost, lack of user privacy and standards by Singh and Mahajan (2014).

Makori (2013) reported RFID adoption is low as not many universities in Kenya have implemented it in their libraries. The low adoption by these libraries could be due to lack of ICT policies and skills and inadequate funding. Therefore, for increased use of RFID by many libraries in Africa, the high cost of the technology has to be seriously considered as many libraries in Africa already have the challenge of cut in their library budget allocation.

Technology is not static as Web 4.0 and 5.0 technologies are presently being discussed in literature (Almeida, 2017), where Web 4.0 is defined as a mobile space where users, real and virtual objects are integrated together to create value (Kamil, 2008) and it involves intelligent agents, mobile technologies and cloud computing (Nevada and Dineva, 2012).

### **Planning Technology Use in a Library**

The introduction and adoption of any technology in a library requires adequate planning for successful implementation. The type of library will determine what technology to adopt because of the size of the collection and the users. For any technology to be adopted for a library, the needs of the users must be known such that the technology will meet users' needs. The perception of the usefulness and ease of use



of a technology by both the library users and library professionals should be considered. This is important because the attitude or disposition of the users and the library professionals to the technology will determine their intention to either use or not use the technology which will have an effect on the actual use. Perceived usefulness and ease of use are constructs in Technology Acceptance Model (TAM) developed by Davis (1989) and modified by Venkatesh and Bala (2008) to Technology Acceptance Model 3 (TAM3). Perceived usefulness is the gain in performance that an individual believes that the use of a technology will assist him to carry out a task or meet his information needs.

Matusiak (2012) affirmed that perceived usefulness relates to the attributes of digital resources, such as format, type, mode as well as reliability, extent, currency, and quality. These beliefs, however, influence users' intention to select the technology and can play an important role in its adoption, especially if technology is new and part of emerging technologies.

Ease of use refers to how easy an individual (library user, librarians) finds a technology to be free of stress in its use and is referred to as perceived ease of use (PEOU). Guritno and Siringoringo (2013) defined perceived ease of use as the degree to which an individual believes that using information technology will free the individual from effort. PEOU determines the intention of an individual to use and the actual use of the technology. Any technology that is found to be easy to use will be adopted and used maximally by users and librarians. A technology that is perceived to be easy to use by both users and librarians will be able to fulfil the purpose of its adoption for

library activities. However, if a technology is found not to be easy to use, when adopted, both users and librarians may not be using such maximally and this will defeat the purpose of acquiring such technology.

The cost of the technology plays an important role to its adoption. Cost refers to the initial cost of the technology, hardware and software costs, maintenance and sustainability costs. The library should consider the costs associated with deploying a technology for its various services due to the reduction in budgetary allocation to libraries. Can the library afford the initial, hardware, software, maintenance and sustainability costs? Is the technology cost effective when compared to the benefits to be derived from it in relation to the costs associated with it? If the library cannot afford the costs due to its financial capability, can it source for funds from organisations to cover the cost? These are necessary issues to consider before the technology is acquired to forestall low performance of the technology.

The adoption of a technology for library services also depends on the ICT skills of the library personnel and the users. Whatever technology that is being introduced into the library will be used by both the library users and the staff, so it is necessary to know if they have the relevant skills to use such before it is adopted. If the librarians and users are found not to possess the requisite skills, then the library management has to provide the needed training to facilitate the acquisition of the skills for the maximum use of the adopted technology. The training could also be given by the provider of the technology and this must be thorough so that the library staff can effectively manage and use the technology after it has been adopted. The



technical support to be provided by the company supplying the technology to the library should include: before, during and after sales which will ensure maximum use of such technology by the library staff who will subsequently train the users from the skills they have acquired.

The planning for a technology to be adopted in a library must take into cognisance the involvement of the library staff. The library management must discuss the need to adopt a particular technology at management meetings which has heads of all units in the library, who will inform the library staff in their unit about the need to adopt technology to improve service provision in the library. The involvement of the library staff is expected to show their relevance to decisions taken for improved productivity and efficient service delivery. Library staff should, therefore, be involved in the selection of the technology, that is, there should be a team or committee which should involve library staff from each unit, to discuss extensively over a stipulated period and eventually select the most appropriate technology to deliver services that will meet the information needs of users. Planning also involves investigating libraries that have adopted the proposed technology to know their evaluation and challenges of such technology before its adoption in the library. This will enhance the decision to either adopt or not adopt that technology.

Chelliah, Sood and Scholfield (2015) in their study of RFID technology in Sydney, Australia reported that the integration of technology depends on people (library users, library staff), processes (library services) and technology (type). The library users and staff must be involved in the implementation of any technology for the success of the technology.

The library staff and users must be aware of the need to acquire the technology (that is the justification for the technology), benefits and how they will be introduced to its use (what training programme that will be provided?).

From preliminary visits to university libraries, technology can be integrated by the librarians if they possess the required technical expertise. If not, the library can employ a consultant to implement the technology. Another way could be allowing the company supplying the technology to assemble and install it for its successful implementation and provide training for the library personnel to ensure its use after the installation.

### **Methodology**

The study comprised ten librarians in charge of ICT (electronic or systems) from ten universities in South-west, Nigeria: Adeleke University (AU), Ede, Osun State; Covenant University (CU), Ota, Ogun State; Ekiti State University (EKSU), Ado-Ekiti; Federal University of Agriculture (FUNAAB), Abeokuta, Ogun State; and Lead City University (LCU), Ibadan, Oyo State. Others include: Olabisi Onabanjo University (OOU), Ago-Iwoye, Ogun State; Redeemer's University (RUN) Ede, Osun State; University of Ibadan (UI) and University of Lagos (UNILAG), Akoka, Lagos State; University of Medical Sciences (UMS), Ondo State. The librarians in charge of ICT (electronic or systems) were interviewed using a comprehensive form indicating type of technology in use, purpose of use and factors considered in planning for the technology to adopt and the data were analysed thematically.



## **Presentation of Results**

The results of the interview will be reported based on themes. All the university libraries were using library software, social media and only four were using RFID.

### **Type of library software in use and purpose of use**

All the university libraries were using library software, although the type varies from one library to another. Most of the university libraries were using Koha except UI using VTLS, CU and UNILAG were using Millennium, EKSU was using Strategic Library Automation Management (SLAM). All the university libraries that adopted Koha were using the software mostly for cataloguing, circulation, retrieval and online registration. However, UNILAG was using Millennium for all library operations. The use of library software in all the ten universities indicated that it is important to facilitate service delivery to its users. The findings were supported by that of Adetimirin (2016) in a study on use of Koha to improve service delivery in universities in South-west, Nigeria.

### **Use of Cloud computing and its purpose**

Out of the ten university libraries investigated, only five were found using cloud computing for library services. Covenant University was using cloud computing for institutional repository (IR), LCU for google drive, RUN for hosting of e-resources, UI for back up, storage and file transfer and UNILAG for database resource sharing.

### **Type of social media use and purpose of use**

All the university libraries were using one social media or the other, however all were using Facebook. Facebook was used mostly for information dissemination and sharing, publicity and promotion of library materials and services and reference services, interaction and feedback. However, Twitter was used in CU, EKSU, RUN, UI and UNILAG for interaction and feedback and UMS for public relation services. Blogs were used in CU for reference service, RUN for current issues about the library and UI for library newsletter. WhatsApp was used in AU, OOU and UMS for information sharing. Only UI was using wikis for collaborative work, while UI and UNILAG were the only ones using RSS for current awareness services and web presence respectively.

The results of the findings indicate that social media is used to create awareness of the services provided in the library and promote such services to the library users. The use of social media in libraries is inevitable as many library users use it for other activities, so it becomes necessary for university libraries to adopt social media to remain relevant to their users. The result of the purpose of using social media in the university libraries is supported by the findings of Mabwezara and Zinn (2016) that library professionals in South Africa and Zimbabwe use social media to market information services and for reference. In the study of Olajide and Alao (2016) in Nigeria, it was averred that library professionals use social media for service delivery to users.



## Use of Radio Frequency Identification (RFID)

Four university libraries were found to be using RFID: CU, LCU, UI and UNILAG, however RUN was in the process of adopting it for its library. All the four university libraries used RFID for circulation and security of library materials. The adoption of RFID in just four universities may be attributed to the high cost of installing the technology and considering the inadequate funding of university libraries in Nigeria, this could be a major challenge to its adoption. This was affirmed by Singh and Mahajan (2014) in their study on adoption of RFID in libraries in India, where it was reported that RFID is expensive.

## Factors considered in the planning to integrate technology into the library

All the librarians reported that perceived usefulness, perceived ease of use, cost, ICT skills of the library staff and the involvement of library staff were considered when planning to integrate technology in the university libraries. For libraries using Koha, cost was considered in the decision to adopt it as Koha is open access software which is free. CU and UNILAG libraries reported that the library software adopted was expensive as it is a proprietary software and not free, but the cost benefit of the software was the reason for its adoption.

A technology that is perceived to be useful and easy to use will be considered for adoption as reported by Venkatesh and Bala (2008) in the Technology Acceptance Model 3 (TAM3). The result of adoption of technology in the universities revealed that perceived usefulness and perceived ease of use were some

of the factors considered when planning the technology to adopt. This is corroborated by Matusiak (2012) who reported that perceived usefulness is important in technology adoption and Guritno and Siringoringo (2013) that reported that perceived ease of use of a technology will determine the adoption of a technology or not.

## Method of Technology Adoption

Most of the university libraries used consultants to install the library software except FUNAAB and LCU where the library staff was reported to have installed Koha without the assistance of a consultant. In CU, UI and UNILAG, it was a combination of both library staff and consultant that installed the library software. This could be because both CU and UNILAG are using Millenium software which is proprietary software while UI is using a customised software. The integration of social media and its use was done by the library staff in all the universities.

The findings revealed that many of the university libraries used consultants for the installation of the library software in their libraries. This indicate that the library professional do not possess the required ICT skills to perform this duty, even for Koha which is an open access software. This calls for adequate training of the librarians especially the systems librarians to acquire the necessary skills to integrate technology in the libraries and also maintain such technology. This will reduce the cost of involving a consultant to carry out duties that the librarians could perform if they have the requisite skills.



## Conclusion

Use of technology to carry out different library services is important and globally accepted as it improves services provided by libraries to users to satisfy their information needs. Libraries can only remain relevant to the society especially users when the appropriate technology is adopted based on adequate planning. Therefore, universities libraries in Nigeria have embraced technology, although the type and level of technology use varies in these university libraries.

## Suggestions

University libraries have adopted technology for their various activities, however the following has been suggested:

- i. maintenance and sustainability of the new technology into the library system through regular funding will allow for maximum use by the library personnel and users.
- ii. Equipping the library staff with relevant ICT skills will lead to improvement in the job performance of the library staff and users' satisfaction.
- iii. challenges such as inadequate ICT skills should be eliminated through the provision of appropriate and regular training programmes.

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