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Awareness and Adoption of Cloud Computing in Nigerian Libraries: An Aid to Library Services

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Introduction

Technological innovations are rapidly evolving and individuals are doing their best to catch up with this speedy evolution that is very visible in all spheres of human endeavors. In today's Information and Communication Technological (ICT) era, new technologies are now being viewed as an indispensable tool that can improve most organizational processes swiftly. According to Hussin and Rohani (2015), 'when an organization adopts new technologies, they gain competitive advantage and as well become more efficient and productive' because of the overwhelming competition and changing corporate environment, Organizations keep striving to adopt new technologies to improve their commercial maneuvers and cloud computing is not an exception. Cloud computing is a new technology of computing services offered over the internet. It provides a shared pool of resources that helps people to access their personal or specialized corporate use of the information such as emails services, social networking, file storage, and sharing, online image storage, etc these are all provided by cloud computing service providers such Amazon, Google, Microsoft, Oracle. etc.

Information and communication Technological advancements have always had significant effects on educational systems, this is as the result of the need to deliver efficient services from little resources that have overwhelmed learning institutions. However, when resources are shared among learning institutions, it will enable the institutions to concentrate more on research work and core academic activities. (Udenor, Aneke & Obillo, 2018). The library and information science profession are daily facing challenges due to the application of new technologies, new concepts are being added to suit the present information managements. Libraries become automated and more efforts are being made towards virtual and now cloud computing. The latest technology trends in Libraries and information centers is the use of cloud computing which has been proven helpful for achieving the economy in a Library function. It is very obvious now that cloud-based services have matured and become prevalent, thereby offering a range of new technology tools for libraries. Cloud computing technologies, present librarians with varying technology proficiencies and the ability to access and use technologies and related services that might otherwise be beyond their reach, as cloud computing becomes more of a mainstay, many librarians are considering a new way to adopt these third-party tools in their work. According to Sultan (2010), Cloud Computing has become an important tool in the world of information technology. as a result of its capability in proving solutions to several IT issues also, it's cheaper with the limitless storage facility, A pool of easily usable and accessible virtualized resources (such as hardware, development platforms, and/or services).

These resources are dynamically reconfigured to fit in a variable load (scale), that can enable optimum resource utilization. The infrastructure provider offers guarantees utilizing customized SLAs and the subscription is by the pay-per-use model (Vaquero, Rodero–Merino, Caceres, & Lindner, 2009). Cloud Computing can be explained in two parts: First Naone, (2007) opined that is an act of using a web browser on the internet to dynamically allocate or deallocate the access of the remote computing resources based on the users' demands, and the second part refers to paying for the real use of the computing resources and facilities" (Hoover & Martin 2008). Yatin, Alias, Awang, and Burhanud-din (2018) reiterate that Cloud computing provides almost all technological facilities needed in organizations at the cost of very less-skilled personnel and computing devices. Cloud computing has been further defined by Quddusi (2014) as the technology that uses the internet or network as central remote servers to maintain the data and applications where the installation is not necessary to use any applications and only require internet access to access their files. Cloud computing, is "a type of parallel and distributed system consisting of a collection of interconnected and virtualized computers that are dynamically provisioned and present as one or

more unified computing resources based on service-level agreements established through negotiation between a service provider and customer (Buyya, Yeo, & Venugopal, 2009)

According to Sahu (2016), Cloud computing is a type of computing that relies on sharing computing resources rather than having local servers or personal devices to handle applications. The National Institute of Standards and Technology (NIST) has given a concrete definition of cloud computing as “a model that enables ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources such as networks, servers, storage, applications, and services that can be swiftly provisioned and released with minimal management effort or service provider interaction”. While to Qusay (2011), is “a type of Internet-based computing that provides shared computer processing resources, data to computers and other devices on-demand instead”. More so, some Libraries uses Integrated Library Management Software (ILMS), in their service delivery, and mostly maintained by library staff, his /her responsible involves hardware maintenance, software and backups /upgrade when a new version of such software is available. Library professionals in most cases may not have the required knowledge in maintaining servers they, therefore, find it difficult to undertake some of these activities without the support of IT experts. However, with cloud computing the reverse is the case, as the cloud service provider takes responsibility and effectively handles issues related to backups, upgrades, as well as server-related hitches.

In this technological era, libraries are noted for innovative service provision. Most of their service operation is depending on computer-generated infrastructures. As learning is now relatively virtual. Hence most of the resources are electronic and web-based. However, some works of the literature suggest that there are challenges still facing libraries although most of these libraries are automated. In most cases, the library frequently searches for low cost and best options that may enable them to store and provide an efficient services, however, with the automation of these libraries, most of its services have not been effectively served. Under such conditions, cloud computing may be a way out of all the ebbs of the information technology, with these challenges, libraries can take advantage of cloud computing to get out of storage challages and technology problems by focusing on the advantages that cloud computing have to offer. Consequently, to provide uninterrupted services to its users, the library needs to be aware, secure, and adopt a platform where access must be unrestricted and not location-specific. Therefore, this study seeks to examine the awareness and adoption of Cloud computing in Nigerian libraries.

Objectives of the Study

The study covers awareness and adoption of cloud computing in Nigerian libraries. The specific objectives are to:

1. find out the level of awareness of cloud computing among library personnel;
2. determine the purpose of using cloud computing services by library personnel;
3. ascertain the cloud-based library services offered by library personnel; and
4. identify the areas of adoption of cloud computing.

Research questions

1. What is the level of awareness of cloud computing among library personnel?
2. What are the purposes of using cloud computing services by library personnel?
3. What are the cloud-based library services offered by library personnel?
4. What areas have cloud computing been adopted?

Literature Review

Concept of cloud computing

Cloud computing is now being used by most organizations, its application includes, data backup in a case of disaster recovery, software development, and big data analytics. Cloud computing is now being adopted by various professions as well such as health where it is used to develop personalized treatments for patients also financial services companies are using the cloud to sway real-time fraud detection and prevention more so, Video game producers are not left out as they use the cloud to deliver online games to limitless players. The National Institute of Standards and Technology (NIST) has identified five essential characteristics of cloud computing: “on-demand service, broad network access, resource pooling, rapid elasticity, and measured service”. Cloud services exhibit five essential characteristics that demonstrate their relation to, and differences from, traditional computing approaches:

On-demand self-service: this those not require human interaction with a service provider, a customer can singly serve itself computing capabilities like server time and network storage as needed automatically. Secondly, in Broad network access, capabilities are made offered over the network and accessed via standard mechanisms that stimulate use by heterogeneous client platforms, thirdly Resource pooling is a situation where computing resources are pooled to serve multiple consumers with the aid of multitenant model, with diverse physical and virtual resources which are dynamically assigned to suit the demand of the consumer., fourthly in rapid elasticity, capabilities are unlimited on rapid elasticity, it can be provisioned rapidly and quickly and as well as automatically scale out and in and as well can be purchased in any quantity at any given time, lastly, on measured service, the provision of services is being monitored for the benefit of the user and consumers, it also automatically controls resource usage by leveraging a metering capability.

Cloud computing service models

Choosing a cloud service provider gives users more or less control over their cloud depending on the type. However, when choosing a provider, it is very essential to compare the intent of use. The need will vary depending on what one needs it for, either in libraries, for business, for health services, or personnel benefits as all these needs and purposes require different cloud types and services. Cloud service models are in three categories that one can subscribe to Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). It has been detailed by several scholars as they pointed out its usefulness. Such as (Mell & Gance 2011, Swapna & Biradar, 2017, Dhaka 2017, Neethus & Vanaja 2017, (Makori 2016; Ireno, Tijani & Bakare 2018; Chudasman, Bhatt, & Trivedi ,2019). These three types differ in the level of control that one has over its contents, and the specific functions deliver by the service providers.

Software as a Service (SaaS): services are delivered to users from any online devices. Installing, upgrading and maintenance are the sole responsibilities of the service provider two packages are made available free and also subscribers benefit from low costs. The free one’s web 2.0 applications, Skype, Hotmail, and Google Apps, while most business-oriented SaaS, such as Salesforce, are leased on a subscription basis. On the subscription, level access is available 24/7. Platform as a Service (PaaS): These services provide computing platforms with supplies tools to enable companies to build, test, and deploy Web-based applications. Infrastructure as a Service (IaaS)/ or Hardware as a Service. Amazon’s Web Services is one of the leads in this area it involves

both storage services and computing power. Amazon's Web Services offers two main products including the Elastic Compute Cloud (EC2), that offers computing resources, and the Simple Storage Service (S3) for data storage.

Cloud Computing Deployment Models

National Institute of Standard Technology (NIST) explained to cloud deployment models as follows:

Private cloud: the private cloud infrastructure is usually operated for a specific organization; the infrastructure may exist on-premise or off-premise. The organization can choose to manage it by itself or by a third party. Although on-premise infrastructure is usually expensive but secured (Balan, Gupta, Kanal, Singh, & Bhanumurthy, 2014). Community cloud: community infrastructure is shared between organizations, that have similar interests, shared concerns in mission, security requirements, and policy. It may be managed by the organizations or a third party and may exist on-premise or off-premise. (Dillon, Wu, & Chang, 2010). Public cloud: This is a type of infrastructure in which the computing infrastructure is run, and situated within the sites of the host company's data centers and not in the customers' premises. That is, it is an off-premise arrangement from which services are provided. The physical infrastructure is not being controlled by the subscriber. The cloud infrastructure is made available to the general public or a large industry group and is owned by the service provider. This type of cloud uses a shared infrastructure pool from which many companies and institutions that need their services share the same infrastructure to run their services. The access is without any geographical location just with internet connectivity. Hybrid cloud: Hybrid cloud is a combination of private, community, or public. The cloud infrastructure of the private, community and public are unique entities but bound together by standardized technology that enables data and application portability for transitive information exchange. They use standard methodologies regardless of ownership or location.

In establishing the relevance of cloud computing in academic libraries, studies such as Adegbilero-Iwari and Hamzat (2017) reviewed the prospect of cloud computing technology in Nigerian academic libraries. They proposed the Library Service Platform (LSP) as the most important gateway for implementing this technology in Nigeria. The study recommended that for successful adoption of LSP in academic libraries in Nigeria, library authority must form the research team for LSP, assess the library workflow, review the current process and apply innovation and technology in library operations and explore open sources tools for maximum utilization of this technology for the betterment of academic libraries.

Similarly, Arpacı (2017), studied the antecedents and consequences of adopting cloud computing education to achieve knowledge management using the technology acceptance model (TAM). His study was carried out on undergraduate students in a Turkish university. Cloud computing adoption can be promoted if educational institutions can be increasing the awareness of knowledge management. On the contrary, Raed, Fash, and Chang (2015). Study on the migration of cloud services and deliveries to higher education revealed that the major challenges affecting the adoption of cloud in these universities under study include data security, lock-in, privacy issues, regulatory compliance, data insecurity, Pillai and Seena (2018) surveyed the application and awareness of cloud computing technology at Kerala University. Their findings revealed that 42.16% of library staff have less idea about cloud technology, this is to say the majority of them are not aware of cloud service modules although the majority of these professionals used Google

applications in their daily tasks. Therefore, the study recommends an urgent need for the library staff understudy to be trained and informed about cloud computing technology

Enefu, Gbaje, and Aduku (2015) investigated the basis for the implementation of cloud computing for the National Open University of Nigeria (NOUN) library services. Their findings revealed the library provides services using various networks. Although they used cloud computing in providing services which do not have a wide coverage as some student is left out. they recommended their library need to provide services through Wide Area Network (WAN) that can provide wide coverage to the student also they suggested a hybrid cloud deployment model

Similarly, Wada (2018) carried out a study on “cloud computing implementations in libraries “ he stated that implementing cloud computing in libraries will significantly reduce the cost of maintaining systems, save energy and expose library to multi-variant information resources and as well for better optimization of library services, he furthered that digital resources, internet service, thin-client architecture, wireless access point and digital librarian are the major prerequisites for cloud computing deployment. A study by Yuvaraj, (2015). “On implementing and sustaining cloud technology at Banaras Hindu University Library (BHUL)”. revealed that the library is providing valued-added cloud-based library services to its users and as well fully prepared to clamps any challenges that may surface towards cloud computing in the university library. This optimistic attitude was confirmed in a study by According to Kaushik and Kumar (2015), the idea of cloud computing is based on a very fundamental principle of reusability of IT capabilities. Cloud computing broaden horizons across organizational boundaries compared to automatic, grid, utility, and distributed computing.

However, some country's economic situation is obstacles inhibiting libraries and information center adoption to clouds, according to Makori (2016), library and information centers in Kenya faced abundant operation needs due to sff economic situations. he also recommended that cloud computing is progressively thrust as the best means to handle and support the delivery of services in the library and information centers. According to Nag and Nikam (2016), Libraries are now loaded with various expenses. On the other hand, with cloud computing, there is little or nothing to finance. “Pay-as-you-go” & “Subscription” methods are two modes of payment in cloud computing. With it, there is no gainsaying that cloud computing will solve storage issues for libraries. In the same vein, Sahu (2015) reiterates that cloud computing has the tendencies of transforming the way services are delivered given libraries a better prospect to extend their impact. Thus, with cloud computing, the cost of computation, hosting, storage, and delivery of services is meaningfully less.

An earlier study by Abdulsalam and Fatima,(2011) explored the applications of cloud computing in higher education in Nigeria, Their study affirmed that cloud computing has great potentials in improving the ICT applications and infrastructure at higher levels of education in higher institutions in Nigeria, although Their study identified some cogent factors that have militated a successful implementation of cloud computing in Nigeria’s higher institutions such factors include unsteady power supply, cost of ownership, lack of access, etc. however for a better transition, they opined such institution keep in contact with reliable organizations such as National Institute of Standards and Technology(NIST) to ensure the suave transition.

Majhi, Meher, and Maharana (2015) conducted a study on “awareness and usage of cloud computing application among LIS professionals” The result revealed that usage of cloud in library operations and services was not significant. A total of 75 % of the library professionals used basic cloud services for personal purposes such as store files online, store personnel videos, and photographs online and as well for collaborative writings and 42 % used this technology for

providing library services. The study further revealed that the deep interest to use this technology in library services and operations as they believed that by applying cloud technology it will reduce the overall cost of library and easy collaboration.

A study by Udanor, Obilo, and Aneka (2018), on implementing cloud computing storage in Nigeria tertiary institutions, was able to develop a model of a stable cloud infrastructure that enables researchers to collaborate and share data among the academia. The design and implementation are based on the Synnefo cloud. Similarly, Yuvaraj (2013) explored the application and usage of cloud technology at libraries of a total of 29 central universities in India. The survey tool designed and collected data from a total of 407 library users from all the universities. Findings revealed that 32.4 percent of library professionals have core computer literacy in terms of professional certification in computer science in addition to a professional degree in library science. Almost 87 percent of the library personnel shows a willingness to provide library services through the cloud. Library professionals indicated the willingness to use layers of cloud computing mainly free software, platform, and infrastructure as cloud services in the central university. Data security and protection of personal data are the major concerns expressed by the library professionals.

Oyeleye, Fagbola and, Daramola, (2014) on the “impact and challenges of the adoption of cloud computing in public universities in the South-west, Nigeria”. Their results revealed that adopting cloud computing has a key influence on cost-effectiveness, enhanced availability, reduced investment in physical assets, reduced IT complexities, and ultimately increased operability. This was affirmed also by Yuvaraj, and Mayank, (2013), that 91% of the organizations in the US and Europe agree that the reduction of cost is a major reason for them to migrate to a cloud environment. From the user's point of view, a study by Ashtari and Eydgahi, (2017) examined The influence of users' perceptions toward the cloud computing technologies was investigated The researchers focused on the associations between variables identified in the literature that were considered to be influencing the perception of students in the university in Southeast Michigan. These variables include users' perceptions of the usefulness and effectiveness of cloud computing applications, perceived ease of use, Internet self-efficacy, computer anxiety, computer self-efficacy. They carried out an online survey among 40 undergraduate students at Michigan University and used the Technology Acceptance Model (TAM) to analyze the adoption of cloud computing by students.

According to Gisolfi, (2015), with the presence of smart technologies and other innovative IT gadgets, today's library patrons are techno-savvy and most prefer to interact via email, instant messaging services, streaming news, and media outlets. Hence, libraries must acknowledge technology trends and re-invent their services to provide efficient services, so as not to be bypassed by users that perceive their services to be slow, unappealing, and irrelevant inactive library service delivery. There is a need for libraries to be proactive by re-strategize and restructure their mode of service delivery to satisfy their clientele (McCallum, 2015). Therefore, embracing new technology trends like cloud computing that can improve service delivery to her clientele is the only way for libraries and information centers survival

Although, the migration to the cloud-based library may not take place out rightly, however it is inevitable to look at various opportunities that cloud base services can offer that will necessitate its adoption by library and information centers. As specified by Neethu and Vanaja (2017) are Cost Efficiency, Scalability, Lower investment, Support included, Greater security and accessibility, Portability, Adjustable storage, Cloud OPAC, Unlimited Storage, Backup and Recovery, Essay Access to Information. More so it is user-centric, interoperability, representation, connect and

convert, and create and collaborate, Easy on installation and maintenance, Highly automated, Better mobility (24x7) service, and Shared resources.

Methodology

Descriptive survey design was adopted for this study. Fifty three library personnel from four private university libraries constitutes the respondent for the study. These respondents were randomly selected from four private universities in Osun State, Nigeria. The universities selected include: Adeleke University Ede, Bowen University Iwo, Joseph Ayo Babalola Univeristy, Ikeji-Arakeji and Redeemers' University Ede. Questionanaire was used as instrument for data collection. Googleforms was employed to create the items of the questionnaire which was administered on the respondents via online professional associations. The data collected was analyzed using descriptive statistics such as frequency counts and percentages were used with the aid of Software Package for Service Solution (SPSS).

Results and Discussions

Table 1. The Universities under survey and the Demographics Information of the respondents

University	Frequency	Percentage (%)
Adeleke University Ede (AU)	10	(18.9)
Bowen University Iwo	22	(41.5)
Joseph Ayo Babalola , Ekije-Arakije (JABU)	11	(20.8)
Redeemers University Ede (RUN)	10	(18.9)
Total	53	100
Sections in the library		
Circulation	21	(39.6)
Cataloguing	13	(24.5)
Reference	4	(7.5)
Acquisition	3	(5.7)
E-Library	12	(22.6)
Total	53	100
Educational qualifications		
PhD	4	(7.5)
MLS/MIRM	22	(41.5)
BLS	24	(45.3)
HND	3	(5.7)
Total	53	100
Gender		
Male	22	(41.5)
Female	31	(58.5)
Total	53	100
Working experience		
1-5	22	(41.5)
6-10	25	(47.2)

11 years and above	6	(11.3)
Total	53	100.0

The analysis as showned in Table 1 above revealed that large number of the respondents from the four universities under survey were Female (58.5%). While (41.5%) of the respondent were Male. With (45.3%) of whom are degree holders

Table 2: Awareness of Cloud Computing

S/N	Awareness of Cloud Computing	Yes	No
	Is a type of computing that relies on shared computing resources , and provide unlimited storage capabilities	49(92.5)	4(7.5)

From the analysis, Table 2 showed that 49 (92.5%) respondents of library personnel from the different universities under survey were aware of the concept of Cloud Computing. While only 4(7.5 %) were not aware. Therefore, this implies that the majority of library personnel are aware of this concept and are not lagging.

Table 3: Purpose of Using Cloud-based Services

S/N	Purpose	Aggregate Agreement Score%/ADS	Aggregate Disagreement Score%/ADS
For Personal Purpose			
1	I use it to Store files online	49(92.5)	4(7.5)
2	I use it to store Collaborative writing output	38(71.7)	46.2
3	I use it to store my personal photos and videos	95(179.3)	11(20.7)
4	I use it to store both received and sent mail	49(92.7)	4(7.5)
For professional Purpose			
5	I assist users in information resources provision/ federated search	36(67.9)	17(32.1)
6	I use it to store the output of my professional collaborative research with put	40(75.4)	13(24.6)
7	I use it for file sharing services to users	43(81.1)	10(18.9)
8	I use it to store created Document/ office software	32(60.4)	13(24.5)
9	I assist library users in information retrieval	40(75.5)	13(58.5)
10	I assist in Providing document delivery services to users	36(67.9)	17(32)
11	I use it to create, upload and save newsletters, new arrivals and forthcoming events for user community	39(73.6)	14(26.4)

12	I use it for users records maintenance/ storage/creating alerts to users based on SDI	48(90.6)	5(9.4)
13	I use it for File synchronization services	36(67.3)	17(32)

From the analysis, Table 3 depicted the responds rate on the purpose of using cloud-based services, given that it can be used for professional and personal purposes. Under the personal purpose of using cloud-based services, it indicates that the majority of the respondent 95(179.3) are using cloud services to Store Personal photos and Videos. However few uses it to store the output of their Collaborative writings, with responded to be 38(71.7) While for professional purposes, the maximum respondent rate indicated that they use it for users records maintenance/ storage and as well as creating alerts to users based on SDI with a responds arte of 48(90.6) The least responds for professional use indicated that they use it tosotre created Document/ office software , with a responded rate of 32(60.4).

Table 4: Cloud-Based Library Services

S/N	Cloud Services	Used	Not used
E-mail services			
1	Gmail	45(84.9)	8(15.1)
2	Outlook	30(56.6)	23(43.4)
3	Yahoo	48(90.6)	5(9.4)
Social Networking			
4	Facebook	45(84.9)	8(15.1)
5	Whatsapp	47(88.7)	6(11.3)
6	Twitter	38(71.7)	15(28.3)
Video services			
7	Youtube	45(84.9)	8(15.1)
8	Vimeo	22(41.5)	31(58.5)
File storages & sharing			
9	Google drive	43(81.1)	10(18.9)
10	Drobox	23(43.4)	30(56.6)
11	SHAREit	24(45.3)	29(54.7)
Information & data collection services			
12	Survey Monkey	44(83.0)	9(17.0)
13	Google forms	46(86.8)	7(13.2)
Event calendar			
14	Google calendar	16(30.2)	37(69.8)
15	Doodle	17(32.1)	36(67.9)
Online representation			
16	Slide share	40(75.5)	13(24.5)
17	Google doc	47(88.7)	6(11.3)
Online file editing services			
18	Picasa	16(30.2)	37(69.8)

The analysis as showed in Table 4 above revealed that in cloud-based services, mailing services was highly used by the respondents with a response rate of (90.6 %) for yahoo.followed by Social Networking, Whatsapp was more used compare to Facebook and Twitter with a response rate of

(88.7%), equally in online representations, Google Doc respond rate was (88.7%). in information and data collection services, Google forms respond rate was (86.85%), there were more utilized than survey monkey, while in video services, Youtube was more used than Vimeo with response rate was off (84.9%). Lastly, other services such as file storage and sharing, Event calendar, and online file editing services were also used by respondents though in file storage and sharing Google drive usage was more significant than others with (81.1%).

Table 5: Area of Adopting cloud computing services in the library

S/N	Areas of Adopting cloud services	Yes%	No%
1	Library portal for new arrivals, book request, queries, and feedback	31(58.5)	22(41.2)
2	Web OPAC, online renewals and reservations storage	40(75.5)	13(24.5)
3	Back up/ information resources storage	43(81.1)	10(18.9)
4	Storage of data and files in a public server	42(79.2)	11(20.8)
5	Library management software (LMS)	47(88.7)	6(11.3)
6	Data import and export	41(77.4)	12(22.6)
7	Resource Repository	41(77.4)	12(22.6)

The analysis as showed in Table 5 depicted areas in which cloud computing has been adopted in the various university libraries under study. The maximum respondent rate indicates that “Library management software (LMS)” is the highest area where cloud computing has been adopted with the respondent rate of 47(88.7%) while the second majority area is Storage of data and files with the response rate of then 42(79.2). then “Back up/ storage of information resources” with a respondent rate of 43(81.1%). Then followed by “Data import and export” and equally “Resource Repository” with a response rate of 41(77.4%) respectively. Cataloging g and classification response rate is 40(75.5%) and the least response rate is Acquisition with 31(58.5 %) response rate.

Discussion of Findings

Based on the findings from the study, the results are discussed as follows: Findings to research question one awareness of cloud computing revealed that library personnel from the four University libraries understudy had a response rate of (92.5%), this indicates that large number of the respondents from these universities under survey in Osun state, were aware with the concept Cloud Computing. This further implies that they are not lagging. This finding is in agreement with the study of Majhi, Meher, and Maharana (2015) who found out that 85.7% of library and information science professionals in 17 Indian university libraries were aware of cloud computing. On a contrary, a study by Pillai and Seena (2018) on the application and awareness of cloud computing technology at Kerala University revealed that 42.16% of library staff have less idea about cloud computing.

The findings to the research question two revealed that large number of the respondent with respond rate (179.3%) were using cloud services to Store personel photos and videos, this finding agrees with the study of Majhi, Meher, and Maharana (2015) whose study revealed that usage of cloud in library operations and services was not significant, a total of 75 % of the library

professionals used basic cloud services for personal purposes. Also, Yuvaraj (2013) explored the application and usage of cloud technology at libraries of a total of 29 central universities in India, out of 407 library users only 87% percent personnel show willingness to provide library services through the cloud.

The finding from the research question three revealed that the most cloud-based services is social networking with (88.7) respond rate and Online representations respectively (88.7). Based on the research question four, the maximum respondent rate indicates that “Library management software (LMS)” is the highest area where cloud computing has been adopted with the respondent rate of (88.7%). A study by Oyeleye, Fagbola and, Daramola, (2014) on the “impact and challenges of the adoption of cloud computing in public universities in the South-west, Nigeria”. Affirmed that adopting cloud computing has a key influence on cost-effectiveness, Similary Arpaci (2017), asserted that Cloud computing adoption can be promoted if educational institutions can increase the awareness of knowledge management.

Conclusion

The trends in information and communication technology (ICT) are unrelenting. Novel technological devices keep evolving with possibilities of offering innovative services. These technologies are playing a dynamic role in library services as well. The library has always been a point of contact for information therefore, the Libraries a time faces many challenges that always result in the adoption of new technologies. The adoption becomes necessary in order to ease processes involved in service delivery and ultimately to satisfy the needs of its users. It has become obvious that present library users are tech-no savvy therefore, have transformed their information-seeking behavior to a greater extent, which calls for new means of satisfying their queries. However it was shown from the study that large number of library persons are aware of what cloud computing is but however uses it mostly for personal purposes. Furthermore, with the alternatives at the beck of patrons today there is no gainsaying that, dependence on libraries and information centers may shift. The only way to remain relevant is by creating awareness and adopting new technologies like cloud computing that has the potential in adding creativity and innovative service delivery to its users.

Implications of the Findings

There are several practical implications of this study for the library and information professions. Firstly, to create awareness, an adoption of cloud computing services, cloud computing service providers need to create room for sensitizing their customers and also to teach them about the performance benefit of cloud services to library service delivery. By so doing, it will help the librarians to understand the relevance of this technological innovation to their daily routine. Secondly, the librarians will need to assess cloud computing technologies by considering the security challenges associated with it.

Libraries have always faced storage issues due to the need to have a robust collection, However, the implication of adopting cloud-based library services by Libraries will thereby create a limitless storage capacity thus providing efficiency, increase reach, pave room for collaborative services reduce cost, improve workflow with faster access to services. Therefore, Libraries need to consider reallocating resources from managing technology to developing added-value services that satisfy the demands of patrons.

Furthermore, creating a centralized knowledge-based information pool is one of the prerequisites to deliver efficient unified service delivery. Therefore, adopting cloud computing can help in achieving a general repository that can be accessed by all. From the foregoing, there is no gainsaying that the library needs to channel their energies and expertise into sourcing out creative ways of adopting new technologies and training their staff to familiarize themselves with it.

Recommendations

Based on the findings of this study, the following recommendations are therefore presented.

1. Libraries need to adopt cloud computing services to improve service delivery by encouraging library personnel to use it for professional use.
2. The university management needs to frequently organize training and retraining on the installation of different routers, switches, various communication media, these are good options, that can provide skills and knowledge on networking which are essential for managing cloud computing services.
3. Before the adoption of cloud computing technology, consideration should be given to privacy issues and all levels of security matters. This will give consumers the assurance that their resources are secured and save from intellectual property theft.
4. There is a need to curb all avoidable factors that could militate against cloud computing adoption such as Internet services and electricity should be resolved before engaging in cloud computing adoption in the libraries. Alternatively, the library can consider the use of a solar energy system and the use of an inverter to complement the electricity supply
5. Digital librarians need to extend their areas of researches to cloud computing that will enable them to participate and make some reasonable contributions to the development and utilization of cloud computing systems in libraries.

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