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Awareness and Utilization of Cloud Computing Technology for Library Services in Universities in Edo State, Nigeria

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Abstract. This study investigates the awareness and utilization of cloud computing technology for library services in universities in Edo State, Nigeria. Employing a descriptive survey design, the research assesses the extent to which librarians are informed about cloud computing, the types of cloud technologies in use, and the degree of their application in university libraries. Findings indicate that while librarians recognize the potential of cloud computing to enhance service delivery, improve access to digital resources, and support teaching and research, there are significant gaps in awareness and practical adoption. The study highlights the need for targeted educational initiatives, increased funding, and regular training to equip librarians with the skills required to leverage new technologies effectively. Recommendations include organizing workshops on cloud computing, ensuring continuous professional development, and encouraging proactive adaptation to technological changes. The research concludes that for university libraries to remain relevant and responsive to user needs, a strategic shift from traditional to personalized, technology-driven services is essential, with cloud computing serving as a catalyst for improved efficiency and broader access to information resources.

1. Introduction

The contemporary information environment in libraries has been significantly affected by developments in communication technology. Libraries now provide information resources and services to meet user needs through physical and bibliographic access to electronic information resources because of the development and usage of information transmission technologies. This implies that libraries are becoming more exposed to modern ways of information service delivery using cloud computing. These technologies enable libraries to provide access to information resources, managing databases, and services to support teaching, learning, and research for community development.

Cloud computing is an Internet-based computing that provides shared computer processing resources, data to computers and other devices on-demand (Qusay, 2011). This implies that cloud-computing technology uses internet or network as central remote servers to maintain data and applications where installation does not necessarily use applications but requires internet access to files (Quddusim, 2014). Cloud computing technology encompasses the infrastructure, platforms, and software that enable cloud services. While cloud-computing services are, the actual offerings and functionalities provided to users or organizations through the internet, using the underlying technology. Therefore, understanding both aspects is crucial for libraries utilizing cloud computing for service delivery.

Awareness is a state of being "in the know" or pre-informed about the presence of an item or facility in an environment. In this study, awareness of cloud computing for library services involves understanding the potential benefits and applications of cloud technologies, as well as the challenges and risks involved. This will enable librarians and relevant stakeholders to be current with latest trends, best practices, and technologies in the field of cloud computing.

Utilization is the ability to exploit and benefit from certain facilities, items or environment to satisfy specific needs (Makinde, 2017). Utilization of cloud computing refers to the actual adoption and

implementation of cloud-based solutions to deliver library services. This includes migrating library systems, databases, and resources to cloud platforms. Currently, the internet has facilitated search and retrieval of information and end-users have become information-independent, implementing cloud-based collaboration tools, utilizing cloud storage for digital collections, and using cloud computing for data analysis, preservation, and access. Thus, cloud computing involves the utilization of Amazon, Google, Microsoft, Oracle to organize photos on Picasa or searching the Web with Bing and Artificial Intelligence (AI). Consequently, awareness and utilization of cloud computing for library services in universities is crucial for libraries to stay relevant, improve their service delivery, and effectively support the academic community. It involves being knowledgeable about cloud technologies and making strategic decisions to implement cloud-based solutions that meet the specific needs and goals of libraries understudy. Therefore, the focus of this study is to examine awareness and utilization of cloud computing technology for library services in universities in Edo State, Nigeria.

1.1 Statement of the Problem

Cloud computing technology enables libraries to provide access to information resources, managing databases, and services to support teaching, learning, and research for community development. Despite the potential benefits of cloud computing in modernizing library services, enhancing user experiences, and optimizing resource utilization while reducing costs and improving security, there appears to be lack of awareness and utilization among university library staff, administrators, and stakeholders regarding the capabilities and benefits of cloud computing technology for library services. Awareness however, does not suggest use; hence, deficiency in awareness poses challenge to the adoption of innovative and efficient library services. Hence, without proper understanding and education on security measures on effectiveness of cloud computing, universities may continue to rely on traditional, less efficient methods of managing library resources and services. Therefore, addressing these challenges will necessitate educational initiatives, financial support, and capacity building to encourage the adoption of cloud computing technology in libraries. This, in turn, will enhance access to information and improve efficiency and effectiveness of library services in Edo State, Nigeria. Thus, study seeks to examine awareness and utilization of cloud computing technology for library services in universities in Edo State, Nigeria.

1.2 Objectives of the Study

The objectives of this study are to:

- Ascertain the extent of awareness of cloud computing technology for library services in universities in Edo State, Nigeria.
- Identify types of cloud computing technology used for library services in universities in Edo State, Nigeria
- Determine the extent of utilization of cloud computing technology for library services in universities in Edo State, Nigeria.
- Ascertain the effects of cloud computing technology for library services in universities in Edo State, Nigeria.

1.3 Significance of the Study

The study will be useful to librarians, university libraries, users, and management team. It will assist librarians to fill the gap that exists between cloud computing technology, and library services. It will enable university libraries to provide seamless access to digital resources such as e-books, academic journals, multimedia content, and research databases. It will also help libraries in collaborating with other libraries for better service delivery.

While library users will have robust information resource for teaching, learning and research activities by providing relevant materials speedily. Similarly, improved accessibility of cloud-based library services will enhance remote access that will allow students, lecturers and researchers to use library resources from anywhere with internet connection. This access is crucial for conducting high-quality research remotely, search capabilities, and user-friendly interfaces will also enhance the satisfaction of library users, making the library more valuable to academic communities.

It will help management in the reduction of cost of maintaining and upgrading of IT infrastructure, which will enable universities save money on hardware, software, and maintenance expenses by utilizing cloud-based solutions, which could be beneficial for institutions with budget constraints. Consequently, cloud services offer scalability that allows libraries to expand digital resources and services to accommodate growing user demands without significant investments in infrastructure.

2. Literature Review

Cloud computing is derived from the acronym CLOUD, which stands as C for “Computing resources”, L for “Location independent”, O for

"Online accessibility", U for "Utility for users" and D for "Demand by users" (Swapna & Birader, 2017). Therefore, Cloud computing is a broad term that encompasses both technology and services. Suciu (2013) stated that cloud computing is the delivery of computing and storage capacity to serve community of end-user by combining user data, software and on demand computation resources over a network. The components of cloud computing include servers, storage, networking, virtualization, and other technologies that form the foundation of cloud computing. Virtualization allows multiple virtual instances (virtual machines or containers) to run on a single physical server, optimizing resource utilization such as Hypervisors (VMware or Hyper-V), containerization technologies (Docker), and orchestration tools (Kubernetes).

According to Sahu (2016) cloud computing relies on sharing computing resources rather than having local servers or personal devices to handle applications. It is an Internet-based computing that provides shared computer processing resources, data to computers and other devices on-demand. This implies that cloud computing refers to both applications delivered as services over the Internet and the hardware and systems software in the datacenters that provide these services. Surprisingly, digital libraries are currently developing software applications, platforms, and infrastructure over the "cloud" to provide better and easier management of data security because of its location on a central server to facilitate effective library services delivery. It is important that libraries are aware of cloud computing for better library services.

2.1 Awareness of Cloud Computing Technology for Library Services

Awareness refers to the level of knowledge and understanding that individuals or organizations have about a particular concept, technology or service. Awareness is the act of being knowledgeable or familiar about item(s) or facilities in an environment. The use of cloud computing for library services is based on the awareness of its existence, purposes and benefits. Awareness also implies perception of a situation, fact, consciousness, recognition, realization, interest or familiarity of particular development (Ani & Ahiauzu, 2018). Therefore, awareness of cloud computing technology in this study has to do with librarians' level of understanding and access to motivate the use of cloud computing for library services. Notably, Akuffo & Budu (2019) stated that most institutions provide adequate technological infrastructure to promote use of cloud computing, while; others have not maximized the adoption of cloud computing nor created awareness programs. Awareness of cloud computing for library services involves understanding the potential benefits and application of cloud technologies, as well as the challenges and risks involved. This involves librarians and relevant stakeholders staying updated with the latest trends, best practices, and technologies in the field of cloud computing.

The goal of university libraries will not be fully realized if librarians are not aware of cloud computing technologies and how it can be applied in carrying out library services. Ademodi (2015) emphasizes that the expectations of libraries will be realized if the resources provided are properly structured to facilitate its use and enable librarians to provide efficient services that would enhance users' knowledge of available electronic resources. Furthermore, awareness of cloud computing facilitates the use of electronic resources, while unawareness of cloud computing could lead to lack of use which might result in non-existence. If proper awareness of cloud computing is not provided, electronic resources will become irrelevant with time and considered as underutilized and a waste of resources.

Furthermore, most scholars have categorized cloud computing in different types. Wada (2016) identifies four basic categories namely: private, public, community and hybrid deployment models. Table I below: depicts types of cloud computing as follows:

Table 1: Types of Cloud Computing

Service Models of Cloud Computing	Deployment of Cloud Models
♣ Infrastructure	♣ Private clouds
♣ Platform	♣ Public clouds
♣ services	♣ Hybrid clouds
	♣ Community clouds

Source: *Adopted from Swapna & Birader Model*

From the table above, Swapna & Birader (2017) stated that cloud computing can be classified into two types namely: on-the-basis of services and on-the-basis of usage. Hence, on-the-basis of services; include infrastructure as a service (Iaas), platform as a service (Paas) and software as a service (Saas). while on-the-basis of usage involves private clouds, public clouds, hybrid clouds, community clouds and special clouds. These models are commonly referred to as the "SPI" model, where "SPI" stands for Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). These four cloud deployment models are discussed below:

Private cloud: This infrastructure is operated used by specific organization as the infrastructure may exist on-premise or off-premise. The organization can also choose to manage it by itself or by a third party (National Institute of Standard Technology NIST, 2011). Although on-premise infrastructure is usually expensive but secured (Balan, Gupta, Kanal, Singh, & Bhanu Murthy, 2014). Therefore, private cloud is based on shared resources, whose access is limited with organizational boundaries. According to Sucin et al (2013) private cloud is infrastructure provided for exclusive use by a single organization comprising multiple consumers such as business unit.

Community cloud: This infrastructure is shared between organizations with similar interests, shared concerns in mission, security requirements, and policy. It may be managed by organizations or a third party and may exist on-premise or off-premise Suciu et al (2013).

Public cloud: This is the computing infrastructure that runs the organization and situated within the sites of the host company's data centers and not in the customers' premises. This is an off-premise arrangement from which services are provided. The physical infrastructure is not 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. Therefore, public 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 rather uses internet connectivity. For instance, google apps, windows and Azure (Swapana and Birader, 2017).

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 (Quahabi et al, 2014).

2.2 Utilization of Cloud Computing Technology for Library Services

Utilization of cloud computing is the extent librarians utilized cloud computing to provide effective library services (Agbontan, 2018). Awareness however, does not suggest use; hence, it must be noted that usage of cloud computing technologies varies from one place to another for example cloud computing in social networking sites have been used by academic librarians in developed countries to accomplish various library functions such as teaching and promoting information literacy programs, handling reference services as well as posting resources, news and information on library social web page Utilization refers to the extent to which cloud computing technology is used in university libraries. It is the actual adoption and implementation of cloud-based solutions for library services. This involves practical application of cloud computing in university libraries This can be used to migrate library systems, databases, and resources to cloud platforms, implement cloud-based collaboration tools, utilize cloud storage for digital collections, and cloud computing can also be used for data analysis, preservation, and access. Thus, cloud computing involves the utilization of Google's Gmail, organizing photos on Picasa or searching the Web with Bing and Artificial Intelligence (AI). Furthermore, cloud computing system enables libraries to provide services to users. Cloud computing service enhances regular storage of computer data on servers that can be accessed through the internet. Cloud computing provides cost efficiency, scalability, lower investment, support security and accessibility, portability, adjustable storage, cloud OPAC, unlimited storage, backup and recovery, essay access to information. Moreso, cloud computing is user-centric, interoperability, representation, connect and convert, create and collaborate, easy installation and maintenance, highly automated, better mobility with (24x7) service, and shared resources (Neethu & Vanaja (2017).

Besides, Suman & Singh (2016) stated that cloud computing enhances easy access to data over the internet, promotes accessibility to file sharing and savings, reduce of cost managing and maintaining IT system, collaboration of projects at cost effective etc. Ahmed & Othman (2013) highlighted cost reduction, relief from managing complex IT infrastructure, flexibility, and scalability as some of the uses of cloud computing adoption. The most important cloud

computing-based services are access to journals, e-books in library OPAC, as well as librarian interface. These are provided using information mashup, import bibliographic and authority data, reference management and web 2.0 by using twelve checklists (Hamdaqa, 2012). The most common cloud computing service providers to libraries are Worldcat, Summon (Exlibris), Google Docs, Discovery service, Polaris Library System, OSS labs, Scribd, and OCLC.

Essentially, there are three types of cloud computing models that are relevant for library services namely: software as a service (Saas), platform as a service (Paas) and infrastructure as a service (Iaas).

1. **Software as a Service (SaaS)** can utilize cloud-based software applications to deliver various library services. This includes applications of library management systems, cataloging, resource discovery, interlibrary loan and digital asset management. SaaS eliminates the need for libraries to host and maintain these applications on their own servers, as they are provided by cloud service providers. This implies that libraries need internet connection and subscription to access and utilize the software.
2. **Platform as a Service (PaaS):** This allows libraries to develop, run, and manage their own customized applications without the need to build and maintain basic infrastructure. Libraries can utilize PaaS to create and deploy their own cloud-based applications to address specific library services. This model offers libraries flexible and scalable environment to develop new applications or modify existing ones, without worrying about hardware and software maintenance.
3. **Infrastructure as a Service (IaaS):** IaaS provides virtualized computing resources such as servers, storage, and networking infrastructure to libraries. With IaaS, libraries have the flexibility to host and manage their own software applications and databases in a cloud-based environment. IaaS allows libraries to indicate their infrastructure based on their needs, as the cloud provider takes care of required basic hardware and data center management. Nevertheless, libraries can choose different cloud computing models based on their specific requirements and resources. Most libraries often combine these models, depending on the nature of services and size of users. This could also depend on the aim and level of control they desire over their infrastructure and software applications.

2.3 Cloud Computing Technology on Library Services

Cloud computing has significant effects on the services of any organization. Mate (2016) states that cloud computing has cost efficient method to use, maintain and upgrade libraries because of its information, automatic software integration and quick deployment. Yuvarej (2013) affirms that cloud computing power, location and device independency, high scalability, less maintenance and indulgence, unlimited storage capacity, diverse support, faster deployment that enable librarians to provide effective resources and services. These benefits have positive effects on library services and growths. Therefore, cloud computing can have both positive and negative effects on library services (Agbontan, 2018). Significantly, Yahaya (2009) identifies the following positive effects of cloud computing in libraries to include:

Besides, cloud-based services eliminate the need for libraries to invest in expensive hardware and software through budgetary allocation to enhance resources and services. Besides, there are two modes of payment in cloud computing namely, “Pay-as-you-go” & “Subscription”. Cloud computing enables libraries to save costs as they pay only for required services. Therefore, cloud computing technology is flexible and librarians are allowed to add or remove any facilities to save cost and users time. It enables libraries to expand services anytime because numerous users can gain access to the same resources simultaneously. In the same vein, Oyeleye, Fagbola & Daramola (2014) affirmed that adopting cloud computing has key influence on cost-effectiveness, Similarly, Arpaci (2017) asserts that cloud computing adoption can be promoted if educational institutions can increase the awareness of knowledge management. Wada (2018) affirms that implementing cloud computing in libraries will reduce cost of maintaining systems, save energy and expose library to multi-variant information resources as well as optimize library services. cloud computing provides libraries with flexible and scalable storage options to efficiently store and manage large amounts of data, digital resources and preservation of materials.

Moreover, cloud-based library management systems are used to automate various library functions, streamline operations, enhance efficiency and allow staff to provide better user experiences. Cloud computing technology also facilitate library automation as software update and maintenance are automatic by service provider to allow library staff attend to other activities. Besides, cloud computing enables libraries to provide remote access to resources, increase access to digital collections and services for users anywhere and anytime. Remarkably, Internet connection is borderless without geographical boundaries and location to one place or country are not limited but accessible throughout the world. Moreover, cloud-based library management systems

are used to automate various library functions, streamline operations, enhance efficiency and allow staff to provide better user experiences. Cloud computing technology also facilitate library automation as software update and maintenance are automatic by service provider to allow library staff attend to other activities. Besides, cloud computing enables libraries to provide remote access to resources, increase access to digital collections and services for users anywhere and anytime. Remarkably, Internet connection is borderless without geographical boundaries and location to one place or country are not limited but accessible throughout the world. Interestingly, the effects of adopting cloud-based for library services by libraries create limitless storage capacity that provide efficiency, increase reach, 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 sophisticated needs of patrons.

3. Methodology

The study adopted a descriptive research design. The population for this study is eighty-seven (87) which comprises of library staff' in four (4) University libraries in Edo State, Nigeria; which are: John Harris University Library, University of Benin, Benin City, Edo State (27), Ambrose Alli University Library, Ekpoma (30), Benson Idahosa University Library (24) and Igbinedion University Library (6). The Total enumeration method of the entire population of 87 academic professionals and paraprofessional library staff from four (4) University libraries in Edo State, Nigeria was used for the study because the population is manageable and accessible to the researchers. However, there were no sample and sampling techniques. A structured questionnaire was used as instrument for data collection, which was self-developed by the researchers titled "Questionnaire on Awareness and Utilization of Cloud Computing Technology for Library Services in Universities in Edo State, Nigeria (AUCCTLSUEDN)" The data collected was analyzed using descriptive statistical tools. Descriptive statistics of percentages, mean scores ($\overline{X}$) and Standard Deviation (SD) were used to—

Table 1: Frequencies and Percentages of Extent of Awareness of Cloud Computing Technology for Library Services

S/N	Awareness of Cloud Computing Technology for Library Services	Very High Extent (%)	High Extent (%)	Low Extent (%)	Very low Extent (%)	Mean	Standard deviation	Decision
1	E-mail services (Gmail, Yahoo, Outlook)	55 (63.22)	5 (31.03)	27 (5.75)	0	3.57	0.33	VHE
2	Social Networking (Facebook, WhatsApp, Twitter, Video services, YouTube, Vimeo)	53 (60.92)	31 (35.63)	3 (3.45)	0 (0)	3.57	0.33	VHE
3	File storages & sharing (Google drive, Dropbox, SHARE it)	34 (39.08)	44 (50.57)	9 (10.34)	0 (0)	3.29	0.29	HE
4	Information & data collection services (Survey Monkey, Google forms)	(39.08)	(47.13)	(13.79)	(0)	3.25	0.29	HE
	Grand mean					3.42	0.31	HE

Sources: *Field Survey, 2024*

Table 1 shows the mean and standard deviation of responses on extent of librarians' awareness of cloud computing technology for library services in universities in Edo State, Nigeria. Results revealed that the extent of librarians' awareness of cloud computing technology for library services were ($\overline{X}$ =3.42, SD=0.31) which ranges from ($\overline{X}$ =3.25-3.57 and SD= 0.29 -0.33). This shows that ($\overline{X}$ =3.42) is greater than the criterion mean of ($\overline{X}$ = 2.50). Therefore, librarians are aware of cloud computing technology for library services in university libraries in Edo State, Nigeria.

Table 2: Mean and Standard Deviation of Extent of Use of Cloud Computing Technology for Library Services

S/N	Cloud computing services	Very High Extent (%)	High Extent (%)	Low Extent (%)	Very low Extent (%)	Mean	Standard deviation	Decision
1	E-mail services (Gmail, Yahoo, Outlook)	51 (58.62)	34 (39.08)	2 (2.3)	0 (0)	3.56	0.33	VHE
2	Social Networking (Facebook, WhatsApp, Twitter, Video services, YouTube, Vimeo)	39 (44.83)	46 (52.87)	0 (0)	2 (2.3)	3.4	0.31	HE
3	File storages & sharing (Google drive, Dropbox, SHARE it)	32 (36.78)	48 (55.17)	5 (5.75)	2 (2.3)	3.26	0.29	HE
4	Information & data collection services (Survey Monkey, Google forms)	34 (39.08)	46 (52.87)	7 (8.05)	0 (0)	3.31	0.3	HE
	Grand mean					3.38	0.31	HE

Sources: *Field Survey, 2024*

Table 2 shows the mean and standard deviation of responses on extent of use of cloud computing technologies for library services in university libraries in Edo State, Nigeria. Result reveals that the extent of use of cloud computing technologies for library services is ($\overline{X}$ =3.38, SD=0.31) which ranges from ($\overline{X}$ =3.26-3.56 and SD= 0.29 -0.33). This shows that ($\overline{X}$ =3.38) is greater than the criterion. means of ($\overline{X}$ = 2.50). Therefore, there is high extent of use of cloud computing technologies for library services in university libraries in Edo State, Nigeria.

Table 3: Mean and Standard Deviation of Benefits of Cloud Computing Technology on Library Services

S/N	Benefit of use of cloud computing service	Strongly agree (%)	Agree (%)	Disagree (%)	Strongly disagree (%)	Mean	Standard deviation	Decision
1	It creates awareness of cloud computing technology	27 (31.03)	31 (35.63)	0 (0)	29 (33.33)	2.64	0.24	Accepted
2	It facilitates easy retrieval of information	31 (35.63)	27 (31.03)	7 (8.05)	22 (25.29)	2.77	0.25	Accepted
3	It prevents repetition of routines activities	29 (33.33)	29 (33.33)	10 (11.49)	19 (21.84)	2.78	0.25	Accepted
4	It has unlimited storage capacity,	22 (25.29)	27 (31.03)	14 (16.09)	24 (27.59)	2.54	0.24	Accepted
5	It facilitates ease of access to resources	29 (33.33)	31 (35.63)	3 (3.45)	24 (27.59)	2.75	0.25	Accepted
6	It enhances file sharing of resources	29 (33.33)	29 (33.33)	10 (11.49)	19 (21.84)	2.78	0.25	Accepted
7	It prevents loss of data	29 (33.33)	29 (33.33)	5 (5.75)	24 (27.59)	2.72	0.25	Accepted
8	It provides ability to reuse digital resources,	31 (35.63)	29 (33.33)	5 (5.75)	22 (25.29)	2.79	0.25	Accepted
9	Reduction of cost and maximization of utilities	22 (25.29)	33 (37.93)	10 (11.49)	22 (25.29)	2.63	0.24	Accepted
10	It enhances efficient collaboration among libraries	29 (33.33)	31 (35.63)	8 (9.20)	19 (21.84)	2.80	0.25	Accepted
11	It provides security for privacy of data	31 (35.63)	29 (33.33)	10 (11.49)	17 (19.54)	2.85	0.25	Accepted
12	It facilitates Current Awareness Services (CAS)	31 (35.63)	27 (31.03)	13 (14.94)	16 (18.39)	2.84	0.25	Accepted
13	It provides constant internet penetration	29 (33.33)	31 (35.63)	10 (11.49)	17 (19.54)	2.82	0.25	Accepted
14	It provides technical skills among librarians	31 (35.63)	27 (31.03)	10 (11.49)	19 (21.84)	2.80	0.25	Accepted

15	It facilitates Selective Dissemination of Information services (SDI)	29 (33.33)	32 (36.78)	7 (8.05)	19 (21.84)	2.82	0.25	Accepted
16	It enhances digital preservation of information resources	27 (31.03)	34 (39.08)	4 (4.60)	22 (25.29)	2.76	0.25	Accepted
	Grand Mean					2.76	0.25	Accepted

Sources: *Field Survey, 2024*

Table 3 shows the mean and standard deviation of responses on benefits of cloud computing technology on library services in university libraries in Edo State, Nigeria. Result reveals that benefit of cloud computing technology on library services were ($\overline{X}$ =2.76, SD=0.25) which ranges from ($\overline{X}$ =2.54-2.85 and SD= 0.24 -0.25). This shows that ($\overline{X}$ =2.76) is greater than the criterion means of ($\overline{X}$ = 2.50). Therefore, there are benefits of cloud computing technology on library services in university libraries in Edo State, Nigeria.

4. Recommendations

- Librarians need to be aware and educated on how to reposition in this era of new technology.
- It is also necessary that librarians in university libraries must respond to the changing needs of technological upgrade in librarianship.
- Make sufficient fund and training of librarians available by the appropriate authorities for the development, infrastructure, and application of technology services in university libraries.
- Libraries should organize workshops on the awareness of cloud computing technologies in application to library services for library professionals.

5. Conclusion

In the era of technological advancement, it is inevitable for libraries to keep pace with the changing needs of library users. To provide users with the best services, libraries need to deploy the benefits of information communication technology (ICT). The utilization of Cloud computing in university is relatively new enough awareness is still lacking in the area of cloud computing in university libraries in Edo State. As such it is time for librarians to concentrate on providing proactive services and move from the traditional service to personalize information services for the benefits of university community. Hopefully, libraries could focus more directly on services and materials for patrons if their computer hardware and software are handled by information technology (IT) companies of cloud.

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