

ADOPTION OF CLOUD COMPUTING TECHNOLOGY BY LIBRARIANS IN IGNATIUS AJURU UNIVERSITY OF EDUCATION, RIVERS STATE NIGERIA

By

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Abstract

This study investigated “The adoption of cloud computing technology by librarians for service delivery in Ignatius Ajuru University of Education (IAUOE)) Automated Library. Two research questions guided the study. Survey Research design was adopted for the study. The population of the study comprised 30 librarians and para-professionals, working in IAUOE Automated Library. All the population was used for the study. The instrument for data collection was questionnaire. The instrument was distributed, filled and retrieved from the respondents accordingly. The data collected was analyzed using descriptive statistics (mean and standard deviation) to answer the research questions. Findings revealed among others that inadequate information and knowledge on how to access cloud computing services had significant effects on the usage. That inadequate support by library staff hinders use of cloud computing services. Based on the findings, it was recommended among others that adequate awareness of the importance and use of cloud computing should be created for optimal service delivery. In addition, funding for the library should be improved so as to accelerate development and encourage greater library usage.

Keywords: Cloud computing Technology; IAUOE; Librarians.

Introduction

The 21st century advancement in technology has drastically changed the routines and operations of the library as activities that were initially carried out manually are now being converted and performed electronically. Information and Communication Technology has come to stay with its transformation of the world into a global village. Over the past decades, the world has been experiencing significant changes in which the need to acquire, preserve, utilize and disseminate knowledge has become increasingly crucial. The advent of Information and Communication Technology (ICT) has presented age of knowledge and information explosion; although it is still advancing as new ideas and inventions are being introduced. One of the offshoots of technological advancement is the concept of Cloud Computing Technology. Gartner (2012) described cloud computing as “a style of computing in which massively scalable and elastic Information Technology-enabled capabilities are delivered as a service to external customers using internet technologies. Stroll and Kumar;(2009) defined cloud

computing as “the computing software and services that can be accessed via the internet rather than residing on a desktop or internal server.” While Hayes (2008) concluded that cloud computing is a kind of computing which is highly scalable and uses virtualized resources that can be shared by the users. Users do not need any background knowledge of the services before using it. Moreover, a user on the internet can communicate with many servers at the same time and these servers exchange information with one another. Basically, data and adoption in the cloud are available through the Internet; it can also be accessed from anywhere and from any device with Internet connectivity.

Cloud computing is a network of servers connected using the Internet. Its main task is to share information, resources, and software. The Internet acts as the invisible cable that connects everything. This includes all physical and virtual servers all over the globe. Cloud computing is an infrastructure and software model that enables ubiquitous access to shared pools of storage, networks, servers, and applications. It allows for data processing to be done on a privately-owned cloud or a third-party server. This creates maximum speed and reliability.

From the forgoing, it can simply be put that cloud computing technology is a service that gives users access to storage, files, software, and servers through their internet-connected devices such as computers, smartphones, tablets and wearables etc. Cloud computing technologies, provide, store and process data in a location that separates it from its users. Practically, it means having the ability to store and access data and programs over the internet instead of a hard drive.

There are many benefits a library can get from using cloud computing technology by increasing computing performance, storage capacity, universal accessibility and cost reduction. This can help library in terms of fixed and maintenance cost reduction in the IT investment of both hardware and software as well as computer services. With cloud computing, libraries may prevent financial waste, better track staff activities, and avert technological headaches such as computer viruses, system crashes, and loss of data. When cloud computing is used in the library, this will likely have a significant impact on library services.

Libraries are shifting their services to cloud computing technology to facilitate its services anywhere and anytime. In libraries, the following have been identified as possible areas of applying cloud computing: Building Digital Library/Repositories, Searching Library Data, Web Site Hosting, Searching Scholarly Content, File Storage, Building Community Power and Library Automation. The biggest benefit of adoption of cloud computing technology by libraries is that they do not have to purchase software and hardware like they normally do in the case of library automation.

Much like a common utility, library just pays for what was used, and then turn it off when not in use. The idea of paying for only what is used attracts a lot of people to cloud deployment (Creeger: 2009), Library community can apply cloud infrastructure to amplify the power of cooperation and to build a significant, unified presence on the Web. This approach to computing can help libraries save time and money while simplifying workflows. The main focus of libraries moving into the cloud has been due to, the need to unveil their vast collections. (Gbaje and Aliyu 2014).

The mode of information storage and transmission has undergone many fundamental changes in format; ranging from print materials to other information storages and transmitting media like non-print sources such as Compact Disc (CD); Diskettes; Magnetic tapes; CD ROMs; hard disks; punched paper tapes; Internet publications; zip disks; educational video and transparencies; books on cassettes; micro form publications; electric publications; machine readable tape; and cloud computing. Libraries have been using some cloud computing services for over a decade.

Statement of the Problem

Despite numerous benefits that come with the adoption of cloud computing, it has been observed that some libraries have not fully adopted it in rendering services to their clients. This made the researchers to wonder what could be the cause. Could it be that there are numerous constraints facing the adoption of cloud computing technology for library services in our institutions of higher learning? Or is it that, there is inadequate awareness and exposure to the technology and its enormous merits in the library. In order to clear the doubts, the researchers are curious to examine Ignatius Ajuru University of Education Automated library and use it as a case study.

Objectives of the Study

The broad objective of the study is to examine the adoption of cloud computing technology for library services in IAUE Automated library. Specifically, this study sought to:

1. Find out the impact of cloud computing services in IAUE Automated Library.
2. Find the challenges of using cloud computing services in IAUE Automated Library.

Literature Review

Luo (2012) conducted a survey to identify how reference librarians use cloud computing technologies. According to results, video services are the most used (~71%) cloud-based applications. 59.7% of services and calendar services. Basically, cloud is a metaphor for internet and is an abstraction for the complex infrastructure it conceals” (286). It is a style of computing in which IT-related capabilities are provided as a service allowing users to access technology enabled services from the internet without knowledge of, expertise with, or control over the technology infrastructure that supports them (Swaminathan, 2020). Mitchell (2011) talked about what cloud computing is for libraries. The research expressed positive view of the role and potential impact of cloud computing in libraries. Cloud computing is receiving considerable attention because it can alter how librarians provide users with new technologies and information needs. Cloud computing not only changes library service models but also affects hardware and maintenance. Kumar (2017) established in a study ‘Applications of Cloud Computing in Academic Libraries’ that almost in all the operations of Libraries, cloud computing can be applied, hence, all the library services become very easy to perform due to Cloud Computing. Furthermore, as a result of financial crunch and lack of technical expertise, cloud computing becomes more relevant in the modern environment of Information and Communication Technology. Also, Njoku and Ken-Agbiriogu (2021) in a study investigated awareness and use of cloud computing; its implications by libraries in selected academic libraries in Imo State, Nigeria. Findings reveal that there was certain level of awareness on cloud computing technologies and models in the libraries studied. It was also discovered that cloud computing technology were used by libraries in the institutions studied, and economy of resource cost effectiveness and file sharing are some of the major positive implications of librarians’ adoption of cloud computing technologies. However, security and privacy, multiple taxation were also identified as major negative implications of cloud computing adoption by the librarians in discharging their functions in the libraries. Similarly, Suman and Singh (2016) enumerated the benefits of cloud computing to library as thus; enhanced easy access to data over the internet, promotion of accessibility to file sharing and savings, reduction of cost in managing and maintaining IT system, collaboration of projects being cost effective etc. However, it is pertinent to establish in this study that, Cloud computing has evolved a paradigm shift that offers opportunities to library users, information seekers and group of users that are hungry to be provided with limitless and timely, location bound services and information for

their varied information needs. Cloud computing is a new trend of technology that many individuals and organizations are adopting the technology model for IT services. The benefit is that they are saved from hosting and operating multiple servers over their own network. It saves them from the burden and risk of constantly experiencing hardware failure or damage. They have to worry about software installation, upgrading or backup issues. It also eliminates the cost. The idea of cloud computing has emerged for outsourcing of computing infrastructure, failure, so servers are more reliable and highly available storage of client data and applications that are accessed via a remote server” (Ilosch, 2009; Knorr and Gruman, 2008). In cloud computing model, organizations need to buy or pay for only those services which are to be needed. Simply put, cloud computing is the sharing and use of applications and resources of a network environment to get work done without concern about ownership and management of the network’s resources and applications. Cloud computing is a very flexible model. In it, users can also build or prepare their own application which can also be used by others through internet. Actually, it provides a common computing platform. (Scale, 2009). Resources are shared among users. It works very fast in the distributed computing environment. It ensures "on-demand" provision of resources, without having engineers for peak loads. It ensures to work efficiently with multiple users and multiple applications. It reduces cost of services. Users can access it from any part of the world simply through the internet connection because the infrastructure is provided by a third-party. Those applications are easy to maintain as compared to individual applications, since they are installed on a common platform and can be accessed from different places. There are minimum chances of infrastructure failure, so servers are more reliable and highly available. As the Library need not to set its own infrastructure, so there are cost reductions through pay- as-per usage of resources. User can access services by using Application Programming Interfaces (APIs) on the cloud and pay as per the usage.

Research Questions

The following two research questions guided the study:

1. What is the impact of cloud computing services in Ignatius Ajuru University Automated Library-?
2. What are the challenges of using cloud computing services in Ignatius Ajuru University Automated Library?

Research Methodology

This study adopted a Survey Research design. Two research questions guided the study. The population of the study comprised 30 librarians and para-professionals, working in IAUOE Automated Library, and were all used for the study. The instrument for data collection was a structured questionnaire. The instruments were distributed, filled and retrieved from the respondents accordingly. The data collected was analyzed using descriptive statistics (mean and standard deviation) to answer the research questions.

S/N	Items	Female (N=13)			Male (N=17)		
		X1	SD	Remarks	X2	SD	Remarks
1.	Cloud computing	3.18	0.79	SA	3.04	0.68	SA
2.	Cloud computing services offer better archiving	3.14	0.78	SA	3.13	0.78	SA
3.	Cloud computing services provide ease of	2.85	1.03	A	2.84	1.03	A
4.	Cloud computing guarantees better security	2.73	1.07	A	2.72	1.07	A
	Grand Mean and SD	3.03	0.90		3.00	0.88	

SOURCE: Field Survey, 2022

Data Presentation

Research Question 1: What is the impact of cloud computing services in Ignatius Ajuru University Automated Library?

Table 1: Mean and Standard Deviation on the mean responses of male and female librarians

Table 1 shows the impacts of cloud computing services in Ignatius Ajuru University of Education Automated Library. The above table revealed that both male and female librarians agreed that cloud computing services saves time and money and that cloud computing services offers better archiving and storage of accessed resources when compared to traditional book storage method. The result also showed that cloud computing services provide easy access to resources anywhere and anytime and that cloud computing guarantees better security to their archived information resources. It is therefore concluded that cloud computing has the capability of giving access to information much faster.

S/N	Items	Female (N=12) Mean SD	Female Remarks	Xz	Male (N=17) Mean SD	Male Remarks
8.	Insufficient internet bandwidth hinders access to cloud computing services.	2.67	1.05 A	2.67	1.04	A
9.	It is quite expensive adopting cloud computing services	3.16	1.03 SA	3.15	0.83	SA
10.	Inadequate support by library staff hinders use of cloud computing services.	3.16	1.03 SA	2.68	1.05	A
11.	Inadequate information and knowledge on how to access cloud computing services affects use	2.54	1.11 A	3.12	1.11	SA
12.	Insufficient number of computers in- the library	2.63	0.74 A	2.56	1.09	A
13	Constant power outages hamper usability of cloud computing services	3.15	0.75 SA	3.45	0.82	SA
	Grand Mean and SD	2.89	0.95	2.94	0.99	

Research Question 2: What are the challenges of using cloud computing services in Ignatius Ajuru University Automated Library?

Table 2: Mean and Standard Deviation on the mean responses of male and female librarians on the challenges of using cloud computing services in IAUF.
(N=3)

SOURCE: *Field Survey, 2022*

Table 2 presents the Challenges of using Cloud Computing Services in Ignatius Ajuru University of Education Library Automated Library. Results in Table 2 revealed that both male and female librarians in Ignatius Ajuru University of Education all agreed with all the items as seen from the mean values of both categories of respondent. They all agreed that, insufficient internet bandwidth hinders access to cloud computing services in Ignatius Ajuru University of Education. They also agreed that it is quite expensive adopting cloud computing services while inadequate support by library staff hinders use of cloud computing services inadequate information and knowledge on how to access cloud computing services affects use. The result showed that insufficient number of computers in the library and constant power outages hampers usability of cloud computing services.

Summary of the Findings

The study revealed that:

1. Cloud computing services provide easy access to resources anywhere and at all-time.
2. Cloud computing enables people to accomplish tasks quickly.
3. Inadequate support by library staff hinders use of cloud computing services.

4. Inadequate information and knowledge on how to access cloud computing services affects usage.
5. Table 1 shows the impacts of cloud computing services in Ignatius Ajuru University of Education Library. The table revealed that both male and female librarians agreed that cloud computing services save time and money and that cloud computing services, offers better archiving and storage of resources when compared to traditional book storage method. The result also showed that cloud computing services provide easy access to resources anywhere, and anytime and that cloud computing guarantees better security to their archived information resources.
6. Table 2 presents the challenges of using cloud computing services in Ignatius Ajuru University of Education Library. Results in table 2 revealed that all the respondents in Ignatius Ajuru University of Education agreed with all the items as seen from the mean values of both categories of respondents. They all agreed that, insufficient internet bandwidth hinders access to cloud computing services in Ignatius Ajuru University of Education. They also agreed that it is quite expensive adopting cloud computing services while inadequate support by library staff hinders use of cloud computing services. Again, inadequate information and knowledge on how to access cloud computing services affects cloud computing use. The result showed that insufficient number of computers in the library and constant power outages hampers the use of cloud computing services.

Conclusion

Cloud computing can make libraries greener by sharing computing power, thus reducing carbon footprints. It can also create a powerful, unified presence for libraries on web and give users a local, group and global reach. Cloud computing is not a new technology but a new form of computing. Libraries are on the path to apply cloud-based applications in order to enhance their services very effectively and efficiently.

Many challenges or impediments to the deployment of cloud computing services in Ignatius Ajuru University of Education Automated Library were identified. The responses showed that Ignatius Ajuru University of Education Automated Library is not technologically ready for the deployment of cloud computing services.

Recommendations

1. The parent organization and stakeholders of Ignatius Ajuru University of Education Library should organize workshops and trainings to sensitize library staff on effective utilization of cloud computing for optimal service delivery.
2. The library should be well funded so that the challenges could be controlled or wiped out.
3. Awareness of the importance and use of cloud computing for improved library services should be created, to encourage more library patronage.

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