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Cloud Computing Technologies: Awareness and Attitude Toward Usage by Librarians in University Libraries in South- South, Nigeria

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Abstract

The research looked at librarians' knowledge about and attitudes toward using cloud computing technology in university libraries in South-South, Nigeria. For this investigation, a descriptive survey approach was used. There are 374 participants in the research. The goal of this study was to determine how well-informed librarians were about cloud computing, the types of cloud computing that is been used by libraries, what they used it for, how they felt about adopting it, and what difficulties they encountered when using it in university libraries. 374 librarians from universities in Nigeria's South-South area make up the study's population. 214 of the 374 administered surveys were properly completed, returned, and deemed useful. Frequencies and percentages were used to examine the data. The study's conclusions showed that South-South, Nigerian librarians had a high degree of understanding of cloud-based technologies. OCLC, Dropbox and WorldCat were some of the cloud computing technologies used by the libraries. Their usage was intended for digital preservation of information resource as well as bibliographic checking and bibliographic compilation. The majority of participants were enthusiastic with their use. Some of the obstacles preventing the use of cloud computing technologies in the examined libraries were epileptic power supplies, sluggish internet connections, and a lack of technical expertise. The research suggested, among other things, that appropriate training in cloud computing be done regularly. Attending workshops and conferences may help you accomplish this. This should be made mandatory for all librarians, and enhanced backup generators and an adequate power supply should also be offered to reduce the risk of frequent power outages.

Keywords: ***Cloud, Cloud computing, Technology, Academic libraries, Universities, Information and communication technology, World wide web.***

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1. Introduction

Academic libraries are those that were founded and are supported by higher education institutions like universities, polytechnics, mono-technics, and colleges of education. The main goal of every university is to provide its students access to a top-notch environment for instruction, research, and community service. Its responsibilities include the growth of the labour force, research and development in both the formal and unofficial economic sectors. As one of the main means of effectively delivering education to scholars worldwide in this digital age, universities require ICT like cloud computing services [1].

Different ICT, including computers, internet technology, and cloud computing, have arisen throughout time in the educational sector to enhance teaching, learning, research, and information access. The World Wide Web (WWW) and the internet are the most modern technologies that cloud computing is founded upon [2]. According to Sultan [3], cloud computing has developed into a significant tool in the field of information technology due to its capacity to address a number of IT issues, as well as the fact that it is less expensive and offers unlimited storage space as well as a pool of readily usable and accessible virtualized resources.

Cloud computing is a web-based technology that is a new kind of computing and a service that is offered through a network or the internet. After the personal computer (PC) and the internet, it is described as the third revolution in information technology since it is entirely new [4]. Most businesses, including libraries, are increasingly using cloud computing. Its applications include software development, big data analytics, and data backup in case of a catastrophe [5].

A kind of computer technology known as " cloud computing facilitates the distribution of resources and services over the internet, commonly referred to as the "cloud," instead of being confined to local servers, nodes, or personal devices. Cloud computing is the term used to describe the mix of servers, networks, connections, applications, and resources [6]. According to [7], cloud computing gives clients access to processing, storage, and data services. Data may be accessed more often and for a lot less money if it is made available via the cloud. It involves moving computation, data, and services to save costs and maximise profits.

According to [8], cloud computing is a sort of computing in which a lot of IT devices, including computers, are often used for service delivery. Any program that is hosted online is referred to as a "cloud application." In order to provide information services to library users utilizing cloud computing apps, librarians may not always need to install a specific program on their system; instead, librarians will utilize the applications that can be accessed remotely. Information professionals, librarians, and libraries have come to appreciate the emergence of cloud computing. Its effective integration within the library has significantly improved the efficiency of its resources and the happiness of its patrons. Every library's duty is to provide high-quality services that are simple to use and to foster user trust in the library's ability [9]. This can only be done if they can realign themselves to take full use of the potentials of cloud computing technology.

Virtually every aspect of the human sector has undergone radical transformation as a result of the exponential expansion and development of information technology (IT). Today's information society is characterized by a rapid pace of change and growth, particularly in the field of web-based technologies [9].

One alternative solution for libraries to embrace and win back their users' hearts is the development of cloud computing and its use in academic libraries [9]. Academic libraries may now improve efficacy and efficiency by using cloud computing into their offerings. Using the resources and methods at their disposal, they continue to be the center of the institutions they support [10].

2. Literature Review

2.1 Awareness and Attitude of Librarians Towards Cloud Computing Technologies

The 21st century has transforms every area of librarianship, hence it is imperative that libraries become aware of and use cloud computing services. Understanding cloud computing services entails being aware of their presence, significance, and application options. According to the research by [11], university librarians in South-South Nigeria have a favourable attitude toward the implementation of cloud computing technology but little knowledge of it.

The opinions of librarians at university libraries in Iran were examined by [12] to see how much they were acquainted with, using, and knowledgeable about cloud computing in libraries. The research revealed that while librarians' usage of cloud computing services was only minimal in 2019, their familiarity with it was poor.

98.2% of the participants in [13] survey showed familiarity with the phrase "cloud computing," and 87.7% of them were aware of its use in libraries. The purpose of the research was to ascertain how well-versed librarians at Coimbatore-area engineering institutions know cloud computing and how they were using it. Notably, a sizable number of the participants (52.6%) said that cloud computing was useful in libraries in India.

Edwin H found that the public university libraries in South-South, Nigeria had low levels of librarian understanding and perception about the implementation of cloud-based technology. The survey also showed that librarians had a negative attitude regarding the use of cloud-based technology in university libraries [14].

According to research by [1], students only utilize cloud computing services to a limited level, and their use varied greatly depending on the institution's ownership. According to the results, it was suggested, among other things, that university administration create a distinct course as a broad study on cloud computing. According to [15], the librarians at a few institutions in Edo State were quite familiar with the usage of OCLC, WorldCat, and Google Docs. It was discovered that the librarians utilised cloud computing services and technology for cataloguing and collection development tasks. According to the results, it was advised that library management help librarians by giving the library enough money to enable the purchase and upkeep of cloud computing equipment.

Multiple studies by [16]-[22] stated that lack of reliable electricity and slow internet were the difficulties experienced by both librarians and users of the library when attempting to use open electronic resources.

According to [14], 99% of respondents' dispute that their library uses OCLC's World Share Management Services. The same proportion of respondents deny using Polaris (Polaris Library Automation System) for routine acquisition and processing in libraries. 91% of respondents deny that they utilize the Koha ILS and maintenance subscription given by OSS Labs (which leverages Amazon's elastic cloud computing architecture), while 177 respondents (94%) reject that they use Google Apps to transition from desktop to web-accessible apps.

By using cloud computing technologies, libraries and librarians may be able to get beyond limitations like those brought on by locally maintained infrastructure [23]. Librarians and other staff members who deal directly with new technologies should study more and have in-depth information, knowledge, skills, and competences in order to discover the advantages of free levels of service or trial versions given by some of the major cloud service providers [23].

3. Purpose of the Study

This study's goal is to examine how librarians at university libraries in South-South, Nigeria, perceive and use cloud computing technology. The specific objective of the study is to:

Discover how knowledgeable South-South Nigerian university libraries' librarians are about cloud-based technologies.

- To know the types of cloud-based technologies used in the libraries.
- Understand the rationale for employing cloud computing in university libraries.
- Ascertain the librarians' opinions on the use of cloud computing in university libraries.
- Describe the perceived difficulties in utilising cloud-based technologies in university libraries.

3.1 Research Questions

This study was driven by the following research questions:

- To what extent are librarians at South-South universities in Nigeria aware of cloud-based technology?
- What are the cloud-based technologies used in the libraries?
- Why are the types of cloud-based technologies used in libraries?
- How do librarians feel about the use of cloud-based technologies in academic libraries?
- What are the alleged difficulties with using cloud-based technologies in academic libraries?

4. Methodology

For this investigation, the descriptive survey approach was adopted. 374 respondents make up the study's population. Because the population is small and the researchers have ample time to complete the study, the total enumeration and accidentally sampling approach was used. According to [24], when the population is a reasonable size, a researcher may use the complete population for the study. Both federally and state-owned university libraries are included in the university libraries. The respondents' answers to a questionnaire were utilized to gather data. The questionnaires were distributed in three hundred and seventy-four (374) copies, and (214) two hundred and fourteen copies were returned and deemed useful. The descriptive statistics were used for this study.

4.1 Demographic description of the Study Participants

Table 1: Population and Response Rate.

S/N	Name of University	No of Librarians	Questionnaire Returned
1	Federal University of Petroleum Resources, Warri	32	23
2	Federal university, Otuoke	31	17
3	University of Port Harcourt	38	12
4	Delta State University, Abraka	25	15
5	Ambrose Alli University, Ekpoma	15	8
6	Cross River State University of Science &Technology, Calabar	29	19
7	Delta State University, Abraka	21	12
8	River State University of Science and Technology	15	11
9	Edo university, Iyamho	26	14
10	Niger Delta University, Yenegoa	14	8
11	University of Benin	52	32
12	University of Calabar	35	18
13	University of uyo	41	25
	Total	374	214

Table 1 shows that (374) three hundred and seventy-four questionnaires were administered and (214) two hundred and fourteen of them were returned and found usable.

4.2 Distribution of the Respondents by Sex

Table 2: Distribution of the Respondents by Sex.

Sex	Frequency	Percentage %
Male	82	38
Female	132	62

Table 2, shows that 82 (38%) respondents were male, while 132 (62%) are female. This shows that there are more female participated in the study than male.

4.2 Distribution of the Participants by Rank

Table 3: Distribution of the Participants by Rank.

Rank of Librarians	Freque	Percentage
University Librarian	10	5
Deputy University Librari	5	2
Senior Librarian	27	13
Librarian I	29	14
Librarian II	38	18
Assistant Librarian	62	29
Graduate Assistant	43	20

Table 3 shows that the librarians that partook in the study are the UL, 10 (5%), deputy UI, 5 (2%), SL,27 (13%), LI, 29 (14%), LII, 38 (18%), AL, 62 (29%) and GA, 43 (20%). This implies that assistant librarians have the highest number of participation in this study.

Table 4: Academic Qualification.

Qualifications	Freque	Percentag
Ph.D	80	37
Masters	91	43
Bachelors	43	20

Table 4 shows that majority 91 (43%) of the librarians possess Master's degrees. This was followed by 80 (37%) who have Ph. D degrees.

Research Question 1. To what extent are librarians at South-South universities in Nigeria aware of cloud-based technology?

Table 5: Level of Librarians' Awareness of Cloud-Based Technology.

Awareness on cloud computing	Aware	Not aware
Any internet-connected device, including mobile phones, computers, and tablets, may access cloud computing.	191(89%)	23(11%)
With the use of cloud-based technology, libraries may connect online and exchange information.	173(81%)	41(19%)
I am well-versed in the use of cloud-based technology in academic libraries.	185(86%)	28(13%)
Through the use of cloud-based technology, libraries may strengthen community power.	109(51%)	105(49%)
It excludes direct communication with the service provider via people.	167(78%)	47(22%)
Anywhere in the globe may access information that has been saved using cloud computing technology.	202(94%)	12(6%)
I have seen libraries use cloud-based software like OCLC.	124(58%)	90(42%)
The service of cloud computing is available when needed.	179(84%)	35(16%)
The use of clouds minimizes hardware investment.	184(86%)	30(14%)

Table 5 demonstrates the high degree of cloud-based technology knowledge among librarians in South-South, Nigeria. A majority of 202 respondents (94%) said that data saved using cloud computing technology may be accessible from anywhere in the globe. This was followed by 191 (89%) who demonstrated that any internet-connected device, such as a mobile phone, laptop, or tablet, can access cloud computing.

Research Question 2. What are the types of cloud-based technologies used in the libraries?

Table 6: Types of Cloud-Based Technologies Used.

Types		Used	Unused
Dropbox		176(82%)	38(18%)
Hotmail or window live mail		145(68%)	69(32%)
Google Apps (Gmail, Google Doc)		95(44%)	119(56%)
OCLC		194(91%)	20(9%)
WorldCat		164(76%)	50(23%)
Encore		40(19%)	178(83%)

Table 6 shows that majority of the of librarians in South-South Nigeria make use of OCLC 194(91%). This was followed Dropbox 176(82%). This means that cloud computing is been put to use in the respective libraries under study.

Research Question 3. Why are cloud-based technologies being used in libraries?

Table 7: Purpose of Using Cloud-Based Technology.

Purpose	Agree	Disagree
storing the results of my professional team's study.	163(76%)	51(24%)
file sharing services to users.	131(61%)	83(39%)
for bibliographic checking and bibliographic compilation.	192(90%)	22(10%)
help clients with document delivery services and information retrieval for library patrons.	183(86%)	31(14%)
for lending of e-books.	184(86%)	30(14%)
for digital preservation of information resource.	201(94%)	13(6%)
for providing information, to be universally accessible.	165(77%)	49(23%)
bulletins, new arrivals, and upcoming events for the user community may be created, uploaded, and saved.	189(88%)	25(12%)

According to Table 7, the overwhelming majority of respondents (201, or 94%) indicated that they utilise CCT for digital preservation of information resource. 192 respondents (90%) stated that they use it for bibliographic checking and bibliographic compilation.

Research Question 4: How do librarians feel about the use of cloud-based technologies in academic libraries?

Table 8: Attitude of Librarians Towards Using Cloud-Based Technology.

Attitude	SA	A	D	SD
I don't utilise cloud computing since it's a challenging job.	34(16%)	20(9%)	98(46%)	62(29%)
Utilising cloud computing never makes me happy.	103(48%)	65(30%)	6(3%)	40(19%)
Cloud computing is something I like to employ since it allows me to store and preserve informational stuff.	142(66%)	23(11%)	34(16%)	15(7%)
I'm not in the mood to use cloud computing in my library.	23(11%)	54(25%)	101(47%)	36(17%)
I'll need a lot of time before I adopt cloud computing.	51(24%)	9(4%)	54(25%)	100(47%)
The cloud should not be used by libraries.	-	34(16%)	134(63%)	46(21%)

Table 8 shows that the bulk of the participants had positive attitude towards the usage of cloud-based technology as indicated from their responses. Majority 134(63%) and 46(21%) disagreed to the fact that libraries should stay away from cloud computing technologies. This was followed by 142(66%) and 23(11%) who agreed that they like using cloud computing because it enable them to store and preserve information materials. This implies that cloud computing is used in delivering efficient library services and operations to both staff and students in the pursuit of academic excellence.

Research Question 5: What are the alleged difficulties with using cloud-based technologies in academic libraries?

Table 9: Challenges Associated With the use of Cloud-Based Technology.

Problems	SA	A	D	SD
Epileptic power supply	76(35%)	86(40%)	12(6%)	40(19%)
Slow internet connection	58(27%)	87(41%)	60(28%)	9(4%)
Lack of technical skills	81(38%)	63(29%)	34(16%)	36(17%)
Intellectual property mismanagement	54(25%)	76(36%)	8(4%)	74(35%)
Irregular staff training	71(33%)	49(23%)	53(25%)	41(19%)
Lack of computing literacy	65(30%)	72(34%)	34(16%)	43(20%)
There is occasional system failure	71(33%)	39(19%)	52(24%)	52(24%)
Frequent obsolescence of ICT hardware and Software hinders effective adoption and use of cloud-based technology	67(31%)	63(29%)	44(21%)	40(19%)

Table 9 reveals that majority 76(35%) and 86(40%) of the participant indicated that epileptic power supply as one of the difficulties with using cloud-based technologies in academic libraries. This was followed by 58(27%) and 87(41%) who indicated slow internet connection. This points to the fact that regular power supply is a major predictor to the usage of cloud computing in libraries.

5. Discussion of Finding

The study reveals that the level of cloud-based technology among librarians' in South-South, Nigeria is high. This may be as a result of the fact that they are used by librarians in their quest of delivering of effective library services. This is in conformity with [15] who found that the librarians in selected universities in Edo State were aware of the use of OCLC, world cat, and Google docs to a very high extent.

The study shows that majority of the of librarians make use of OCLC. This was followed Dropbox. This means that cloud computing is been put to use in the respective libraries under study. This finding is in agreement with [15], whose study revealed that librarians at a few institutions in Edo State were quite familiar with the usage of OCLC, WorldCat, and Google Docs.

The study shows that the participants use cloud-based technology for the purpose of creating, uploading and saving newsletters, new arrivals and forthcoming events for user community. This discovery is in agreement with [5], big data analytics, software development, and data backup are some of the applications of cloud computing that are currently being adopted by most organisations, including libraries. The study reveals that that the bulk of the participants had positive attitude towards the usage of cloud-based technology as indicated from their responses. This finding is in agreement with [11] whose study revealed that, librarians in university libraries in South-South Nigeria attitude towards the deployment and use of cloud computing is high.

The study discovered that epileptic power supply, slow internet and lack of technical skills were the challenges associated with the use of cloud-based technology as indicated by the librarians in South-South, Nigeria. This finding is in agreement with [16], [18], [19], [20], who stated that lack of reliable electricity and slow internet were the difficulties experienced by both librarians and users of the library when attempting to use open electronic resources.

6. Recommendations

On the basis of the study's results, the following suggestions are made:

- Proper training should be carried out on a regular basis on the use of cloud computing. This can be achieved through workshop and conference attendance. This should be made obligatory for all librarians.
- Effective power supply with improved standby generators should be provided to check the hazard of recurrent electricity power failure.
- Librarians should ensure that they update their knowledge in the area of modern technology to enable them discharge their duties effectively.

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