EVALUATION OF LIBRARIANS' ACCEPTABILITY LEVELS AND USE OF CLOUD COMPUTING FOR LIBRARY SERVICES IN LAGOS STATE, NIGERIA

ADEBAYO, ROKIB ADEDAYO
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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE, INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGY, KWARA STATE POLYTECHNIC, ILORIN

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF NATIONAL DIPLOMA (ND) IN LIBRARY AND INFORMATION SCIENCE

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CERTIFICATION

This is to certify that this project titled **"*Evaluation of Librarians' Acceptability Levels and Use of Cloud Computing for Library Services in Lagos State, Nigeria*"** has been read and approved as meeting the requirements of the Department of Library and Information Science, Kwara State Polytechnic, Ilorin, for the Award of National Diploma in Library and Information Science.

A. O. Isiaka (Supervisor)	Date
A. O. Isiaka (Head of Department)	Date
S. A. Sulyman (Project Coordinator)	Date
External Examiner	Date

DEDICATION

This research is dedicated to Almighty God.

DECLARATION

I, ADEBAYO, Rokib Adedayo an ND student in the Department of Library and Information Science, Kwara State Polytechnic, Ilorin, hereby declare that this research project titled *"Evaluation of Librarians' Acceptability Levels and Use of Cloud Computing for Library Services in Lagos State, Nigeria"*, submitted by me is based on my actual and original work. Any materials obtained from other sources or work done by any other persons or institutions have been duly acknowledged.

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ADEBAYO, Rokib Adedayo
(ND/23/LIS/FT/0133)

Date

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Abstract

This study focused on the evaluation of librarians' acceptability levels and use of cloud computing for library services in academic libraries. The study was narrowed to only academic libraries of Lagos State, Nigeria. The background covers the levels of acceptance of cloud computing from the global, regional and national perspectives. The purpose of the study was to evaluate the librarians' acceptability and use of cloud computing for library services in academic libraries. The objectives of the study were to explore the rationale for adoption of cloud computing in academic libraries of Lagos State; identify the perceptions of librarians on cloud computing in the academic libraries of Lagos State; and highlight the challenges of cloud computing adoption in academic libraries of Lagos State. The study has applied descriptive research using survey approach. There are total populations of 130 librarians across the 6 academic libraries. The sample size for the study will be 97 across the libraries. Questionnaire was used as instrument for data collection. All data collected was sorted and coded for easy handling. Descriptive and inferential statistics methods will be used for data analysis and presentation of results. The key findings from the study were that librarian have adopted cloud computing based specific need attached to their institutional mission and vision, that the benefits derived prompted the need to accept the technology and they believe it can provide a solution to a number of challenges facing their academic libraries. The study also found out that the major bottlenecks were the issue of trust between cloud service providers and consumers which range from data integrity, data ownership, data privacy and absence of legislation that guide and guard deployment of cloud. The study concluded that these challenges have significantly influence their level of acceptance. The study recommends that government should make policies to regulate the activities of cloud service providers.

Keywords: Librarians, Acceptability Levels, Cloud Computing, Evaluation, Library Services, Lagos State

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The field of Library and Information Science today has been facing numerous challenges due to the development in Information Communication Technology (ICT) and its application in various sectors of the society. Ironically, with the emergence of the Internet, libraries are facing problems to justify their services. New concepts are developed within the field to keep pace with technological innovation around the world. Cloud computing, which was developed as a result of Internet and the web, have gradually sets the stride for a new era of computing as it determines the level which we share and store information (Abidi, 2012). Practically cloud computing is all about rendering services through the use certain applications online by the providers to those who needs them on either as a pay-as-you-go basis or by subscription.

The National Institute of Standards and Technology of United State of America (USA) defines cloud computing as a platform which provides a convenient, on-demand network access to a collective pool of computing (e.g. applications, and services) that can be instantly deployed to serve the users of the technology with little or no effort from the service provider (Mell, 2016). According to Priya (2011), Cloud computing is a technology that can provide a service through which one can use applications that are not actually installed on his/her computer, the platform is provided to you as a service by another company and accessed over the Internet. Goldner (2014) propounded that cloud computing is a technology that uses the Internet in collaboration with the central isolated servers to store, share and manage data. Therefore, cloud computing is that technology which allows users to use application, files storage and information sharing over the Internet.

Armbrust, Fox, Griffith, Joseph, Katz, Konwinski, Lee, Patterson, Rabkin, Stocia and Zaharia (2015) defines cloud computing as an assembly of applications using a combination of both hardware and software systems to render services to users via the Internet. Cloud computing is a result of advancements in various technologies, which includes the Internet, hardware and software, systems management and distributed computing (Buyya, Broberg and Goscinski, 2014). Cloud computing provides a variety of services such as information storage, sharing, retrieval and other different approaches of use (Leavitt, 2016). Cloud computing enables organizations to deliver support applications and avoid the need to develop their own IT systems (Feuerlicht, Snášel, Szczepaniak, Abraham, and Kacprzyk, 2016).

Stroh et al, (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." Gartner (2012) defined cloud computing as "a style of computing in which massively scalable and elastic IT-enabled capabilities are delivered as a service to external customers using internet technologies. Infrastructure is buying Space/ times on external servers, Examples are Amazons, A3, and Bungee. Platform on the other hand, is an existing software platform in which one can build its own application on, such as Facebook. While Application is a software application accessed with a Web browser, examples are Google Docs, Salesforce.com, whereas, Service is a ready to use services accessed with a Web browser such as ADP.

Mell, P (2011) defined each of the three services models thus: Software as a Service (SaaS) which allows users to use the provider's applications on a cloud through a web browser, while Platform as a Service (PaaS) allows users to deploy their own applications on the provider's cloud infrastructure under the provider's environment. Infrastructure as a Service (IaaS) allows users to control and manage computing resources. Cloud computing can transform the way information systems are built and services delivered. This provides library with an opportunity

to extend its impact to its users anywhere anytime. Anyone connected to the internet is probably using some type of cloud computing on a regular basis. Whether they are using Google's Gmail, organizing photos on Flickr or searching the Web with Bing they are engaged in cloud environment. As Geoffrey (2013) pointed out, the interesting thing about cloud computing is that it did not start as a technology for the business enterprise, but was driven by the public with services like Facebook and Flickr.

According to Tuncay and Wu (2011), libraries have benefited from using cloud computing technology by increasing computing performance, storage capacity, universal accessibility and cost reduction. This has helped libraries in many positive ways, specifically in terms of fixed and maintenance, cost reduction in the IT investment of both hardware and software as well as computer services, avert technological headaches such as computer viruses, system crashes, and loss of data. According to Spreeuwenberg (2012), with cloud computing, it becomes easier to access data with several devices. Especially for mobile devices, this can be really useful since the only thing that is needed is an internet connection.

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. Nevertheless, the biggest benefit of the adoption of cloud computing technology is that one does not "buy" the cloud, as purchases for software and hardware and hitherto being made for library automation.

The mode of information storage and transmission has undergone many radical 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. Online databases are accessed as cloud applications. Large union catalogs can also be defined as cloud applications. The selection of which of these information resources to use is a continuous process dictated by changing curriculum, availability of new materials for Library Services (Gbaje and Aliyu, 2014).

Several cloud computing projects are already under way or under study. Of these projects, the most solid are the result of partnerships between international players and African economic operators. The benefits to be derived from this advanced IT service appear to have convinced African players, and the indications are that the characteristics of cloud computing would be very appropriate to the African context. This would explain the interest shown by the various stakeholders, each of which is seeking to tap into those benefits as speedily as possible and get in at the beginning, in spite of the technical shortcomings and regulatory difficulties associated with the deployment of cloud computing technology.

Many countries, mainly in the west partake in developing strategies to fast-track the acceptance of cloud computing. Some university libraries especially in more developed and advanced countries (western Europe and America) have implemented the technology for various reasons such as reduced cost of software acquisition, licensing and upgrade to a much bigger access of cloud applications for members of the academic community to enhance their academic outputs (Ercan, 2010). In the United States of America for instance, academic libraries such as in North Carolina State University, Eastern Washington University saves a lot funds on licensing other

applications despite the availability of adequate and sustainable funding. Others include Lakehead University in Canada have save a lot of costs with the adoption of Google mail service. University of Washington have effectively implemented Google classroom application in order to encourage collaborative learning among students and staff (Cenon, 2012).

Developing nations have exploited the power and benefits of these technologies (Erenben, 2016). According to Babu (2012), the swift growth and adoption of cloud computing has been necessitated by recent technological innovations which provides opportunities and alternatives to save cost through introducing relatively cheap computer systems, large storage, platform for sharing and collaboration in businesses and academic institutions In Africa, according to a survey carried out by Cisco and World Wide Worx (CISCO, 2013) South Africa, Kenya and Nigeria are leading countries in use of cloud computing in Sub-Saharan Africa as of the year 2013, 50% of South Africa's academic institutions, 48% in Kenya and 36% in Nigeria use cloud computing applications. Development in information technology is more or less difficult to keep-up with and the speed renders academic libraries to a state enigma and perplexed so as not lose their users to other information service providers.

In Nigeria, the present system in most academic libraries, the IT department is responsible for meeting the needs of all members of the academic community (staff and students), the IT department receives all request from faculties and departments for whatever service is required. The department manages services such as installations and activation students and staff email accounts. With the adoption of cloud computing, it will allow users to perform their tasks at the comfort of their location. Cloud computing applications offers a technology that can any foreseen challenges which may lead to loss of data as it provides a platform for storage and recovery in case of eventualities. This is because, servers where data storage are being made are not physically present in the building and the service providers have some better and more

advance modules for backup and recovery plans that are better than academic libraries can provide (Ume, A., Bassey, A., & Ibrahim, H. (2012).

Akintoye (2016) affirmed that academic institution is such institution which comprised of universities, polytechnics, mono-technics, institutes of technologies, colleges of education and any other post-secondary school. Tertiary institutions play different roles in national development. Okpareke (2015), and Akintoye (2016) noted that the role of tertiary institutions includes manpower development, research and development and training of players in both formal and informal sectors of the economy. Maidabino (2008) define academic libraries as such libraries that are found in institution of higher learning such as the university, polytechnics, mono-technics and colleges. He (Maidabino) further asserts that, academic library is a place for inspiration and a house for knowledge to students, teachers, researchers and members of the academia, and has a number of collections ranging from monographs, digital, and to computerized data-bases which forms the majority of resources accessed by its users. Libraries are an integral part of tertiary institutions.

In providing services to their users, libraries have to continue to evolve with the changing technology and be dynamic by responding to their needs in terms of nature, content and channels in which information is disseminated (Mavodza, 2013). It's as the result of this background; the researcher intends to evaluate the librarians' acceptability levels and use of cloud computing for library services in academic libraries of Lagos State, Nigeria.

1.2 Statement of the Problem

There are numerous threats that continue to bedevil the growth of academic libraries in Nigeria today in spite of the adoption of automation of library services that leads to digitization of resources. Some of these threats include: unreliable internet connections, librarians' technical know-how and show-how, epileptic electricity, poor and short of funds for the libraries.

Similarly, systems hardware issues, application and systems software issues, workforce training and development, outdated applications software of business are some of the problems experienced by automated libraries. Ideally, the "predictions on the increase in the rate of adoption of the cloud technology, the acceptance level is still very low according to a survey carried out by TechTarget from September 2012 to March 2013 on the actual rate of adoption and usage of cloud computing, the results show that the adoption rate is not rising as expected with security concerns being the most prominent reason for the reluctance in the acceptance of the cloud technology".

Despite the important contributions of cloud computing, academic libraries get trapped in persistent and continues upgrade mode, which involves lots of trials and errors, re-testing and customization that is time consuming. This is even made more complex by the issue of remote access, media archiving, trust between vendors of the technology and users, data security, data privacy and ownership and the struggle to keep pace with technological innovations. Those challenges necessitated this study so as to evaluate the librarians' acceptability levels and use of cloud computing for library services in tertiary institutions of Kaduna State, Nigeria in the face of all the challenges.

1.3 Research Objectives

The purpose of this study is to evaluate librarians' acceptability levels and use of cloud computing for library services in academic libraries of Lagos State, Nigeria. The specific objectives are:

i. Explore the rationale for adoption of cloud computing in academic libraries of Lagos State;
ii. Identify the perceptions of librarians on cloud computing in the academic libraries of Lagos State; and

iii. Highlight the challenges of cloud computing adoption in academic libraries of Lagos State.

1.4 Research Questions

This study set out the following research questions to be answered:

i. What is the rationale for adoption of cloud computing in academic libraries of Lagos State?
ii. What are the librarians' perceptions of cloud computing among academic libraries of Lagos State?
iii. What are the challenges of cloud computing adoption in academic libraries of Lagos State?

1.5 Scope of the Study

This study focused on librarians' acceptability levels and use of cloud computing for library services in academic libraries of Lagos State, Nigeria. The variables of interest were limited to acceptability levels of cloud computing, use of cloud computing and library services. The study will cover the university libraries from Lagos State, Nigeria. The study will adopt a descriptive survey method; questionnaire will be used to collect data from the librarians which reflected individuals' opinion on the acceptability levels and use of cloud computing for library services in academic libraries. IBM SPSS V26.0 will be used to carry out both descriptive statistics such as frequencies and percentages counts.

1.6 Significance of the study

Cloud computing is seen as a technology that is still new, the study may be beneficial to librarians, academic institutions, special, private and public libraries. The study intends to evaluate the librarians' acceptability levels and use of cloud computing for library services in academic institutions of Lagos State. To librarians as information vendors, they may benefit from the result of this study as it may help them to improve on their technique to information provision, records dissemination in addition to data storage and retrieval. The study may also benefit to the academic institution's administration in policy formulation. It may enable them to understand the need to allocate adequate funds for regular training of staff who may use the technology effectively and efficiently.

The university administration may therefore, be in a better position to make adequate provision to ensure that internet connection is available within its campuses, this can allow for appropriate and maximum utilization of the technology. Similarly, it may be beneficial to the libraries and its management in the sense that it will reveal to them the degree of effectiveness of the cloud computing technology in meeting the information needs of the users and consequently encourage them towards working out modalities to improve the functionality of cloud computing technology if the need arises. More also, it will help to reveal the extent to which cloud computing technology is being adopted by the academic libraries as it will highlight the past and present state of the adoption of cloud computing technology in the library for its services. The improvement of cloud computing in the library will lead to better library services for the fulfilment of the objectives of the libraries. Cloud computing acceptance may lead the librarians to gain knowledge about practical problems facing traditional library practice. This would be useful for teaching, curriculum design, review and implementation.

Cloud computing would help the librarians to gain access to intellectual knowledge and creative thinking within the academic environment. This would help them solve specific product/service design problems including production of new products and services. Such adoption would also enable the librarians to work towards the continuous improvement of the quality of the products and services. This would go a long way in boosting public satisfaction. The findings of the study may also benefit future researchers. This is because the suggestions for further research may serve as reference tool for their research.

1.7 Operational Definition of Terms

Academic libraries: these are types of libraries found in tertiary institution of learning such as universities, colleges, polytechnics etc.

Cloud: Public or Semipublic space in the cloud used for transmission.

Acceptability Levels: is a measure of how much the librarians agree with or approve of cloud computing.

Use: it is the action of using something or the state of being used for a purpose. It is also the value or advantage of something.

Cloud Computing: it is a style of computing services in which massively scalable and elastic IT-enabled capabilities are delivered as a service to external customers using Internet technologies.

Library Services: is the performance of all activities of a library relating to the collection and organization of library materials and to making the materials and information of a available to the users.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter reviews the literature that relate to the subject of the study. The literature review is organized according to the specific objectives of the study and are broken down into the sub-headings; the rationale for adoption; areas where cloud computing can be applied for library services, and presumed challenges of cloud computing adoption in academic libraries. The purpose of the review was to provide an understanding of what has been done in the area of the study and to discover other possible problems arising as a result of the problem to be studied. The chapter concludes with summary of the research gap.

2.2 The Need to Adopt Cloud Technology in Academic Libraries

Many researchers have found out the rationale for the adoption of cloud computing platforms by libraries most especially academic ones. Goldner (2014), was of the opinion that, libraries that transferred their services into cloud have chance to display their vast collections to unlimited number of users globally. Flexibility is important if a library has to maintain its character and yet be adaptive to inevitable and unpredictable changes that happen at an accelerated pace. This calls for librarians being able to provide a wide variety of information from an equally varied selection of sources and formats, particularly with the prevalence of cloud use (Ambrose, 2015). The implication is for librarians to work as complementary teams within the library and with other relevant departments and or institutions (Christinger, 2017).

The benefits of cloud computing cannot be over emphasized despite the fact that most library professionals face problems in the installation of software, server management, checking for updates and configuration management, which has nothing to do with the core mission and services of library. Even if the library software is launched, due to lack of necessary infrastructure, complexity of software and lack of highly skilled library professionals, Online Public Access Catalogue (OPAC) management is difficult. With the emergence of cloud-based library management systems, IT support including installing hardware or the up gradation of systems is circumvented.

Cloud computing has emerged as an attractive option for organizations, like libraries, that might choose to focus on their core challenge instead of IT problems. This because cloud computing has solved the urge for making use of constrained resources (Wale, 2015). Moving library core programs to cloud-based services will reduce or eliminate most or the whole local technical needs in handling server hardware and systems applications that underlie the applications (Luo, 2013). Cloud computing is no longer the most effective advantage that librarians as-customers and organisation can benefit from. However, cloud computing still attracts libraries so many ways such as how libraries should deal with price range cuts and unavailability of adequate funds.

According to Christinger (2017), cloud computing provides colleges and universities with a means to upgrade software and IT hardware attracting students and keeping pace with digital technological developments. Scale (2015) puts forth his view that cloud computing is currently enabling librarians to shift from the paradigm of ownership and maintenance of resources towards the provision of access to information maintained and controlled by others. Although, cloud computing involves more responsibilities and obligations of the service provider and the

client library need to worry about such things like local bandwidth, hardware and software configuration as well as systems and software application (Prince, 2012).

Furthermore, Sorensen and Glassman (2015), cloud-based applications offer libraries new ways to present information or offer services that were previously unaffordable or unavailable. Patel, Seyfi, Tew and Jaradat (2012) have enlisted four core areas of cloud computing solutions in libraries: technology, data-hosting archives, information and community. Simultaneously, various scholars have argued that cloud computing was already in practice before the concept gained momentum and there are ample possibilities in the future. Hoy (2012) asserts that many library patrons are already using cloud products such as Gmail, Google Docs and bibliographic management tools for their daily needs. This is as against previous e-mailing services that are provided mainly to a few members of the academic community with so many restrictions and no online storage platform.

Cohn (2012) believes that libraries use database providers or integrated library management system vendors who provide outside the user servers to host library software program and information within the cloud. Romero (2012) argues that in the area of library automation, there are numerous commercial vendors already providing different adaptations of their cloud services which make the use of the cloud viable to a lesser or greater quantity. Yunchuan (2014) have argued that, cloud computing can save an academic library's time and money, but trusting the system is extra vital because the real asset of any corporation is the records which they proportion inside the cloud to use the wanted services through setting it both immediately within the relational database or eventually in a relational database via an application software. This therefore, have indicated that data security and privacy is concern for every user of cloud computing. Sun (2012), in an article and have discovered out that there are some initiatives that are better applicable to cloud computing than others.

Flexibility and price savings are the exceptional motive for transferring projects to the cloud (Yuvaraj, 2015a). Libraries as enterprises have benefited from cloud computing solutions in four core areas: technology, data hosting archives, information and community. In a related development, libraries as a community host center can apply, the concept and deployment of cloud computing to strengthen the power of inter-library cooperation and to build a substantial and unified presence on the web and the internet (Erenben, 2016). This can help libraries save time and money by eliminating ICT-related headaches and allow them to take advantage of new technology based on Web 3.0 (Christinger, 2017). Despite the numerous benefits that cloud computing promises, its adoption faces numerous challenges. These challenges include Security implications, trust between providers and consumers, legal considerations, organizational setup and compliance requirements.

To this end, defining the scope and boundaries of the library services in the cloud, data trust, privacy, migration and backups and competencies for cloud librarians is therefore necessary to keep up to date with the issue of IT skills so as to be able to perform their duties effectively and efficiently. The transfer of services to the cloud will allow libraries to share, to disseminate, to collaborate with other institutions globally, regionally and nationally through consortium. The rationale can be categorized into the following headings: technology improvement and data efficiencies:

2.2.1 Technology Improvements

Cloud technology was built on recent technological innovations and it is therefore necessary to be design in such a way that it can be improve upon and be flexible enough to accept changes due to technology improvement. A typical example is the use of handheld devices to have access to variety of information resources and on the other hand, libraries use social media to render library services effectively, efficiently with limited funds.

2.2.2 Data Efficiencies

Geoffery and Walker (2015), propounded that all data that has been stored in the cloud platform, libraries stand to benefit from it through easy retrieval and sharing of such resources between users and collaborating institutions. Therefore, the necessity for data storage within the library, its preservation and backups are hereby unnecessary. Collaborating libraries can share data freely, effectively and efficiently. Numerous scholars developed an intellectual contention of the interpretations regarding the concept and implication of Cloud computing adoption in libraries. Yuvaraj (2015b) in Sadeh, (2017) observed that "the widespread adoption of web search engines and other Internet tools and services and the emergence of players such as Google Scholar and Windows Live Academic in the scholarly information-retrieval arena have reduced users' dependence on library support to fulfill their information needs".

Cloud computing and web collaboration are the two concepts that give new innovative developments in library automation as observed by (Vaquero, Rodero, Caceres and Lindner, 2019). Cloud computing enable for more optimal use of resource, and it simplify the accessibility of information to be more effective and reduce unnecessary expenses. In other words, the position of libraries to adopt cloud technology is solely based on its significant service-oriented mission.

2.3 Areas where Cloud Computing can be Deployed in Academic Libraries

Noa (2015) in a study titled "An exploratory study on factors affecting the adoption of cloud computing by information professionals, have found that the behavioral intention to use cloud computing was impacted by perceived ease of use and personal innovativeness". Libraries are moving their services via the cloud technology which provides access to unlimited resources irrespective of time and geographical location (Mate, 2016). Clouding computing technology provide enduring benefits to libraries by providing avenues to upload data into the cloud with

relative ease and security (Nandikishor, 2012). According to Yunchuan, Zhang, Xiong, and Zhu (2014), in their article titled “Data Security and Privacy in Cloud Computing” have found out that, Cloud computing environment provides two basic types of functions: “computing and data storage”. The following possible fields were identified by Yuvaraj (2015) as potential areas where cloud computing services and applications may be applied in the library.

2.3.1 Searching Library Data

Many academic libraries today have online catalogues and share bibliographic data with Online Computer Library Center (OCLC). OCLC is one of the best examples for making use of cloud computing for sharing libraries data. It offers different platforms for library services such as circulation, cataloguing and classification, acquisition etc via what is called web share management system.

2.3.2 File Storage

To store data on the cloud a number of services are available such as Dropbox, Jungle Disk, Sky Drive, Bitcasa Infinite Drive, SugarSync, Amazon Cloud Drive, OneDrive, Apple iCloud, Evernote etc (Christinger, 2017). These platforms allow virtual share of the resources as well as access to those resources remotely. LOCKSS (Lots of copies keeps stuff safe), CLOCKSS (Controlled LOCKSS) and portico tools are extensively used for digital preservation purpose by libraries (Yan, 2015).

2.3.3 Searching Scholarly Content

Currently, Information and Library Network (INFLIBNET) center has incorporated Knimbus cloud service into its UGC INFONET DIGITAL Library consortium in order to search and retrieve scholarly contents attached therein. Knimbus is cloud-based research platform facilities to search and share the scholarly content. It is dedicated to knowledge discovery and

collaborative space for researchers and scholars. Knimbus is currently used in over 600 academic institution and R&D labs by scholars, researchers and scientists as well as over 50,000 researchers (Yang, 2012). Now Knimbus proposed a free offer to get registered to empower the libraries for dynamic searching and also for single point search interface, maximum the usage of all e-resources, customized search across selected sources reduces noise and highlights relevant content and tools to support the complete research lifecycle.

2.3.4 Website Hosting

According to Mavodza (2013), website hosting is one of the earliest adoptions of cloud computing as many organizations including libraries preferred to host their websites on third party service providers rather than hosing and maintaining their own service. Google sites serve as an example of a service for hosting websites outside of the library's servers and allowing for multiple editors to access the site from varied locations.

2.3.5 Digital Library and Repository

According to Christinger (2017), libraries can use Dspace or Fedora to develop and maintained their digital libraries and institutional repositories. Another cloud technology is Dura cloud which can provide all what is required for developing institutional repositories with a standardized interface and open-source codes for easy adoption. To this end, academic libraries have various alternatives to choose from depending on where and what service to deploy cloud computing to. This is in harmony with the nature of the library service which the library wants to render to its users.

2.4 The Extent of Cloud Computing Use in Library Services

Cloud computing has become an attractive option for organizations, like libraries, that would prefer to concentrate on their core mission rather than IT issues. This because cloud computing has solved the urge for utilising limited resources (Wale, 2015). Shifting library core applications to cloud-based services will reduce or eliminate most or the entire local technical needs in managing server hardware and operating systems that underlie the applications (Liu, 2013). Cloud computing not only benefits individual end-users and companies but also attracts libraries in many ways when they must cope with budget cuts and constrained financial resources.

Flexibility is important if a "library has to maintain its character and yet be adaptive to inevitable and unpredictable changes that happen at an accelerated pace. This calls for librarians being able to provide a wide variety of information from an equally varied selection of sources and formats, particularly with the prevalence of cloud use" (Ambrose, 2015). The extent at which cloud computing is used for library services cannot be over emphasized despite the fact that most librarians face problems with software installation and it updates which has no direct implication with library services (Yuvaraj, 2015a). Online Public Access Catalogue (OPAC) management is difficult. With the emergence of cloud-based library management systems, IT support including installing hardware or the up gradation of systems are circumvented (Yuvaraj, 2015b).

Furthermore, Sorensen and Glassman (2015), are of the opinion that cloud-based applications give libraries alternative channels to provide library services that are not available in traditional library operations. Patel et al (2012:9) "have enlisted four core areas of cloud computing solutions in libraries: technology, data-hosting archives, information and community". This is as against previous e-mailing services that are provided mainly to a few members of the

academic community with so many restrictions and no online storage platform. Cohn (2002) believes that libraries use "database vendors or integrated library system providers who provide external servers to host library software and data in the cloud. Romero (2012) argues that in the field of library automation, there are several commercial suppliers already offering various adaptations of their products which make the use of the cloud possible to a lesser or greater extent".

Sun (2012), in an article titled "Avoiding the death zone: choosing and running a library project in the cloud" found out that there are some projects that are better suited to cloud computing than others. Flexibility and cost savings are the best reason for moving projects to the cloud (Yuvaraj, 2015). In addition, the researcher argues that pursuant of cloud computing would enable academic libraries have a better understanding of the practical problems facing traditional library services and LIS profession. Cloud computing would also enable academic libraries test practical application of cloud computing for effective library services. The industry on the other hand will have an opportunity to seek solutions to technical and design problems while enhancing the production of new products and services. The practitioners will also have a chance to continuously embark on quality improvement. And overall, such a collaboration among libraries would ensure an on-going relationship and network between the libraries that form part of the consortia and vice-versa.

2.5 Areas of Concerns in Cloud Computing Adoption

There are several influential factors of adoption of Cloud Computing, the following factors has been identified and analyzed the possible risks and opportunities according to thesis of Jlelaty and Monzer (2012):

A. Reliability: Kim W, Kim S D, Lee E, Lee S, (Kim et al, 2009) stated that cloud service drop is an aspect cloud computing. That outage is unavoidable and users should take it into account

before adopting Cloud Solutions. It might happen for a short or a long time, a few or many times. Even large companies such as Google and Amazon experienced many similar cases in the past and they will have many more in the future. In short, 100 % availability of the service is impossible. Consequently, Kim et al. (2009) recommends that critical applications should not be taken into the cloud. Actually, most of the applications hosted in the cloud are currently non-critical such as back up and software testing. Moreover, users who are using cloud computing solutions should make sure to have backup of their data in other places. Nowadays, cloud providers are trying to avoid outage and promise a high level of availability in the Service-Level Agreement (SLA) and try to compensate their users in the case of an outage of the service. This factor represents a risk and it is one of the effective factors in cloud computing adoption. It will determine the kind of applications that can be used in the cloud along with its adoption strategy.

B. Security: Users of Cloud Computing give the cloud provider full control over their data and they should trust that this third party will take care of their business, secure the data, and do backups for them. This issue can be partly solved by Service-Level Agreements (SLA) where the conditions of security issues in the contract will be clarified (Benlian and Hess, 2011). Security issue is one of the biggest doubts when users think about adopting cloud computing as the users do not have their own data in their companies anymore. "Our findings suggest that in respect to both SaaS adopters and non-adopters, security threats are the dominant factor influencing IT executives' overall risk perceptions" (Benlian and Hess, 2011:341). However, Marston S, Li Z, Bandyopadhyay S, Juheng Zhang & Anand Ghalasi, (Marston et al. 2011:180) asserted the same idea stating that "almost 75 percent of IT executives and CIOs report that security is their primary concern". However, Kim et al. (2009) argue that security issues is a concern in all computer systems not only the cloud hosted ones and achieving a 100% secure

computer system is almost impossible as expert hackers will have new ways for breaking the security strategy in any system.

Kim et al. (2019) have argued that “we can enhance the security of the computer system by hosting it in the cloud as we will have some expert people who will care about securing the server and the computer system which might not be possible for small and medium companies”. Moreover, the same technologies which are used for securing the on-premise computer system can be also used in the cloud. Finally, the cloud providers today are employing the latest technologies and the highest standards in securing their servers and hosted applications. “We believe, however, that the clouds are not less secure than on premises computing systems” (Kim et al., 2009). Marston et al. (2011) also agrees that this issue is being enhanced now and it also has some advantages by giving the company more control options over their data. In conclusion, security issues can be seen as an opportunity and a risk at the same time, but it is mainly a doubt as it is seen by cloud adopters and non-adopters. It plays an important role in determining the kind of applications which are taken into the cloud and the industry type which can adopt cloud solutions.

C. Performance: The main source of performance problems come from the connection quality between the user and the cloud computing server, mainly when more users are connecting at the same time and large amounts of data are transferred between the end user and the cloud server. This results in a slowdown in the cloud service (Kim, 2009; Benlian and Hess, 2011). The performance issue is an important factor which companies have to think about when adopting Cloud Computing. Companies should measure their possible current and future bandwidth and processing requirements before they decide to adopt Cloud Solutions. Performance is seen as one of the main risks, and an important opportunity at the same time (Marston et al., 2011).

D. Scalability: Scalability is an important factor that should be taken into account in terms of performance. As the requirements of the cloud computing users increase, the cloud provider should be able to scale up their resources and infrastructure to satisfy the user's new requirements of storage, processing, and connection bandwidth (Benlian and Hess, 2011). On the other hand, scalability in cloud computing is one of the main strength points and constitutes an important opportunity for institutions and organisations. As these organisations' requirements change, their infrastructure will be scaled up or down dynamically providing a high level of strategic flexibility.

E. Amenability and Physical Location: Since cloud computing is a fairly young technology, so far, there are no rules and governmental regulations that really exist to set the boundaries and laws regarding the storage of data by enterprises on third-party computing facilities that are shared with others. Moreover, some old regulations already exist concerning the enterprise data privacy, access, and location without taking Cloud Computing into account, and these regulations might be violated by Cloud Solutions (Kim et al., 2009). For instance, while many countries have regulations concerning the physical location of enterprise data, the cloud providers cannot guarantee the exact physical location of the data, and even some of them have policies to hide such kind of information from the end user. However, some companies are now trying to solve this issue and comply with the local regulations specifically in the United State America. For example, Amazon Web Services (AWS) has started a new service called the Amazon Virtual Private Cloud which allows users to connect their own infrastructure to AWS computing resources. Compliance with regulation is a real risk when adopting cloud solutions and it is being handled by cloud providers now. “Perhaps the biggest factor that will impede the adoption of the cloud computing paradigm is regulation at the local, national, and international level" (Marston et al., 2011:178).

F. Integration with other Services: Libraries need to adopt different types of applications from different cloud providers and these applications might need to interact with each other. At the same time, some companies might adopt a hybrid strategy of cloud solutions as public clouds have different characteristics from that of private clouds. Consequently, the integration between the data from these different applications needs to be achieved and this issue poses many technical and business challenges for cloud service providers and cloud users (Breeding, 2012). On the other hand, Mashups (Mashups are a web services providing data or functionality relying on different external sources) can be a real opportunity in cloud solutions. Nowadays, we can see new types of Mashups relying on cloud services; integrating two or more cloud services into one new service. Amazon's 'GrepTheWeb' is one example of cloud mashups (Marston et al. 2011).

G. Environmental Issues: Environmental issues constitute a real concern for companies in this era as more regulations are issued to minimize the carbon footprint organizations leave behind. A previous 'Forrester' survey concluded that most workers in IT departments believe that the efficient use of energy and recycling IT resources are important issues that should be handled properly and these factors constitute the main element of green IT. Thus, migrating the IT functionality into the cloud, companies not only reduce their IT infrastructure but also use the energy in an intelligent way (Goldner, 2014). However, other researchers suggest that cloud servers are consuming a huge amount of energy and not all cloud providers are following the best standards in energy efficient consumption, consequently, moving to the cloud does not reduce the global CO2 emissions necessarily (Kim et al., 2009). In conclusion, moving to the cloud can reduce the IT infrastructure by sharing with others and cloud providers can follow best standards in energy efficient consumption which might not be possible for the small companies as a result of the economy scale, but adopters of cloud computing should make sure that these providers are applying these environmental standards before adopting their solutions.

H. Cost: Cost is a very important factor and opportunity in Cloud Computing. "Cost advantages are the strongest drivers affecting IT executives' perceptions of SaaS opportunities" (Benlian, and Hess, 2011:342). Similarly, Marston et al. (2011) are of the opinion that, companies need to spend a big part of their balance on the IT infrastructure, while less than 10 % of their servers can be really utilized, resulting in a big waste of money. In addition, these servers need to be replaced almost every three years and need to be maintained and administrated, increasing the total cost of IT operations radically. Cloud computing has reduced these costs remarkably. "Economies of scale for datacenters cost savings can lead to a five to seven-time reduction in the total cost of computing" (Marston et al., 2011:179).

Furthermore, cloud computing reduces the cost of entry for educational institutions in developing countries where they operate with little resources. By adopting cloud solutions, educational institutions can use expensive business analytic software, which require high level of IT infrastructure to enhance their service at relatively low cost, while this kind of applications was available only for large companies or enterprises before. However, other researchers point out some possible economic risks. Benlian and Hess (2011) argued that there is a hidden additional cost in cloud computing more than the anticipated one. For instance, cloud computing users might need to customize these common platforms to fit their specific requirements and consequently they will be responsible for maintaining the customized code and have to pay additional cost more than what they expected at first.

Kim et al. (2019) asserted the same idea and mentioned that adopters of the cloud computing take the “only pay for what you use” into account and they forget about the other potential hidden costs. For instance, cloud computing adopters cannot totally rely on the providers to administer their solutions and maintain them, they still need to do monitoring of performance and availability of resources in the cloud which require additional time and cost, moreover,

they will need to pay for the additional bandwidth they might use in the future. Finally, cloud computing adopters should choose the suitable pricing strategy for the adopted solutions which fit their needs. For instance, they might choose to pay per use, monthly, or yearly. In conclusion, cost is seen as an opportunity as it reduces cost for cloud computing adopters but it still has some potential reasonable economic risks.

I. Innovation: Cloud Computing is considered as an innovative disruptive technology and it results in new types of applications with richer functionality than their in-house counterpart. The service helps IT departments' employees to innovate new core business applications instead of doing the daily backup and maintenance routine tasks. "Cloud Computing can lower IT barriers to innovation" (Marston et al., 2011). This is therefore, necessary for cloud librarians to weight in their options critically before moving into the cloud for effective and efficient library services and maintaining their role as information service providers.

J. Technophobia and Changes: While many people might see cloud computing as an innovative technology simplifying IT operations, some librarians might see it as a real challenging threat. They believe that it will be a threat to their job security by outsourcing their daily IT tasks to a third-party company. Even some companies might see cloud computing as a big change in handling IT operations which is somewhat different from the methods, they used to follow for a long time in handling these operations. Benlian and Hess (2011), confirmed the importance of these psychosocial risks, stating that outsourcing IT operations by adopting Cloud Computing can result in the loss of jobs and seen as a failure of the IT departments in conducting their jobs which would harmfully impact the reputation of the IT managers. Consequently, IT managers might respond negatively to the Cloud Computing technology. These psychosocial issues also affect the adoption decision of Cloud Computing.

K. Cloud Service Model (CSM): The kind of applications that can or cannot be implemented in the public cloud is an important issue that companies should think about when they decide to adopt cloud computing. Libraries might have some critical applications which require a high level of availability with sensitive data such as statistical results generated for their daily activities. These types of data might be better if it is hosted in a private not public cloud. Similarly, other institutions like banks, hospitals, ministries, departments and agencies of governments that have other types of applications which can be taken to the cloud to benefit from its advantages. The public cloud applications have different functionality characteristics from its private counterpart. They are generally suitable for the common purposes' applications such as Customer Relationship Management (CRM) systems, while the private cloud would grant more control to its owner compared to the public cloud, and it will be suitable for customized applications.

At the same time, the private cloud can provide some of the advantages of the public one. "It is also clear that not all applications are currently ripe for moving to the cloud for instance general purpose applications (like office, email, collaboration technologies) are prime candidates" (Marston et al., 2011:181). In this case we can have a hybrid cloud of private and public model-types depending on the sort of applications. This strategy allows adopters to use the advantages of the two types and has many other potential capabilities for example when the capacity of the private cloud is exceeded, we might start using the public as well by moving the workload from the private to the public cloud. However, the hybrid cloud can bring some new technical challenges as both clouds will need to have the same hypervisor, file system, and chipsets for their servers.

L. Time to Market: Another factor which should be taken into consideration prior to the adoption of cloud computing is the time to market. Jlelaty and Monzer (2012), states that time

to market with cloud computing can be reduced from months to weeks or even days for the companies who adopt computing services. The cloud services help to eliminate procurement delays for software and hardware, the upfront capital and time investment for purchasing hardware for proof-of-concept work, and accelerate computer power for when applications require running at peak loads. Time to market cloud services by its providers can also be considered some success criteria where an organization can launch new products much faster depending on its goals and culture.

M. Ease of Use: According to a survey conducted by Chief Information Officer (CIO) Magazine (2011), one of the top-rated factors when evaluating cloud computing was ease of use where "senior and midlevel IT managers (both with a 63% incidence) are more likely to feel ease of use is very important when compared to other IT professionals (46%)" (CIO Magazine, 2011). Moreover, ease of use can be considered an important factor in cloud solutions as user experience in human computer interaction is a significant criterion when evaluating whether an application is successful or not. The adoption of cloud computing will result in improving user experience unlike traditional systems like grid computing. Therefore, ease of use can be easily achieved because of Cloud computing and valuable resources can be easily accessed by its adopters.

In addition, the researcher argues that pursuant of cloud computing would enable academic libraries have a better understanding of the practical problems facing traditional library services and LIS profession. Cloud computing would also enable academic libraries test practical application of cloud computing for effective library services. The industry on the other hand will have an opportunity to seek solutions to technical and design problems while enhancing the production of new products and services. The practitioners will also have a chance to continuously embark on quality improvement. And overall, such a collaboration among

libraries would ensure an on-going relationship and network between the libraries that form part of the consortia and vice-versa.

2.6 Global Trends in Cloud Computing Acceptance

As higher education institutions adopt business frameworks and terminology, academic libraries try to show how their own activities can be aligned with institutional goals. This has led to changes in how performance is measured. Instead of concentrating on measuring user satisfaction, in itself, through user surveys and statistics, the demand to link library activity with broader outcomes means that services are examined in order to show how their improvement may enhance the user experience and, therefore, contribute to institutional goals such as increasing remote access to library collections by the academic community. Cloud computing is popular approach for information handling and stockpiling. By using the cloud advancement data is taken care of and set away on the Internet continually. Data appears on client contraptions (PCs, notebooks, netbooks, mobile phones, etc.) by chance as needed.

Cloud computing has transformed into a standard registering model to bolster changing generous volumetric data using groups of thing PCs. It appears to be, from every angle, to be astoundingly troublesome advancement which is grabbing vitality and is a promising standard for passing on IT advantages as utilities. The assessment of cloud computing can oversee colossal data as indicated by on interest administration. Academic libraries began to develop and adopt cloud, led by technology and innovation inclined companies. Many countries, led by the western nations have developed strategies to accelerate the uptake of cloud computing. Developing nations have a huge opportunity to exploit the power and benefits of these technologies provided the right frameworks and investments are in place.

The rapid development and adoption of cloud computing has primarily been accelerated by the emerging computing technologies that enable reasonably priced use of computing systems and infrastructures as well as mass storage capabilities. The possibility of outsourcing computing resources that have the potential to scale-on demand with little or no up-front IT infrastructure investment costs makes cloud computing very attractive to organizations, particularly smaller entities. African countries have introduced cloud computing at different levels according to a study conducted by ITU in 2012. There are very many initiatives by individual countries to upgrade and revise legislative and regulatory frameworks with particular emphasis on the following:

• Transposition to the national level of regional or international texts on data protection;

• Revision of the relevant legislation to take account of the status of data hosted in the cloud;

• Strengthening of legislation, codes of conduct and standards applicable to the ICT sector;

• Clarification of relations between data centre managers, cloud computing and data protection.

South Africa, Kenya and Nigeria are still the leading countries in use of cloud computing in Sub-Saharan Africa as of the year 2016. According to a survey carried out by Cisco and World Wide Worx (2012). The study found that 50% of South Africa's medium and large businesses including tertiary institutions were using cloud services, compared to 48% in Kenya and 36% in Nigeria. South Africa currently leads the continent in Cloud computing uptake, but appears to not be growing fast enough to retain that position in the years to come. For Kenya, in addition to the 48%, another 24% of organisations in Kenya were considering adopting within a short while. Rapid adoption of cloud computing in Nigeria and Kenya was mainly due to the growing confidence of the IT decision makers in the technology and environment.

With regard to training, several African countries surveyed expressed priority requirements in regard to the legal environment of cloud computing and technical considerations relating to networks, IT and the management of data centres. At the level of the mobile operators, cloud computing technology was already used by 33% of the African country operators surveyed, while 23% of those operators had embarked upon its implementation. In the study, over 50% of the economic operators such as big companies had already adopted cloud computing. A number of countries had more than one operational data centre: Tanzania, Gabon, Burkina Faso, Rwanda, Zimbabwe, Kenya, Senegal, Cape Verde and Cameroon. A number of governments had taken specific initiatives to promote cloud computing in their countries. These countries were Benin, Burkina Faso, Burundi, Cape Verde, Gabon, Mali, Rwanda, Tanzania and Togo. About half of the countries had no legislation on data protection.

Despite the numerous benefits that cloud computing promises, its adoption faces numerous challenges. Security implications, trust between providers and consumers, legal considerations, organizational setup and compliance requirements are some of the common research challenges. Despite these misgivings, the pressure to justify the continued funding of academic libraries both to their own institutions and to government is the major challenge facing many directors of academic libraries. The digital age and the expansion of student numbers have led to many changes over the years to create avenues to increase access to library resources. Some of the ways in which libraries are attempting to adapt to the changing market and show how they enhance the user experience is cloud computing.

2.7 Cloud Computing in Nigeria

Cloud computing presents a shift of control from the traditional way of organisations owing their respective data centre/infrastructure to a resolve on resource sharing thereby cutting down the cost of running businesses. The service could be provided using an enterprise's data centre,

or that of a cloud provider. Major Cloud providers in Nigeria are Microsoft, Google and International Business Machines (IBM). They render services as cloud providers. This is done by them in two ways – either providing services directly to organizations or via partnership with other IT/service provider firms (Nnadozie, 2013). IBM is currently managing the data centre of Airtel (Nigeria). This implies that if the telecommunication industries outsource their infrastructure to a major cloud solution provider as Airtel had done, cost of rendering services have drawn down drastically which invariably leads to less pay in making use of their data services. To further enhance Nigerian businesses, IBM is partnering with Sunnet technology solution provider to offer universities and banks a dynamic infrastructure and cloud computing solution that would enable these institutions to ensure that their infrastructural risks are well managed to promote their efficiency and reduce cost of running their services.

Google (Nigeria) offers lots of cloud computing services organisations including banks, hospitals, universities and colleges and rendering enormous support to its clients and partners. Google Apps messaging tools which include email, calendar, and instant messaging solutions helps people to communicate and stay connected anytime anywhere as they wish (Okwoli, 2015). With Google Apps Engine cloud platform, data is never lost and searches can easily be performed with much data storage space available to each user anywhere anytime for hosting documents of different formats, and for easy downloads, enabling secure Realtime collaboration among workgroups, etc. For example, Gmail provides each user with up to 10GB inbox storage space in the cloud, which is quite enormous. There are several communication problems which have hampered the smooth take off of cloud computing in Nigeria. Some of these problems range from broadband to backbone infrastructure.

In Nigeria, the present system in most academic libraries, the IT department is responsible for meeting the needs of all members of the academic community (staff and students), the IT department receives all request from faculties and departments for whatever service is required. The department manages services such as installations and activation students and staff email accounts. With the adoption of cloud computing, it will allow users to perform their tasks at the comfort of their location. Cloud computing applications offers a technology that can any foreseen challenges which may lead to loss of data as it provides a platform for storage and recovery in case of eventualities. This is because, servers where data storage are being made are not physically present in the building and the service providers have some better and more advance modules for backup and recovery plans that are better than academic libraries can provide (Ume, A., Bassey, A., & Ibrahim, H. (2012).

Nigeria the most populated country in Africa with over 187 million people has been described as the largest growing market in Africa's Information and Communications Technology (ICT) market in terms of internet usage and mobile/fixed line subscriptions (Federal Ministry of Communication Technology, Nigeria, 2013). Electronic communication has become the standard of communication in developed countries and they also fast approaching making e-communication the standard. This makes ICT a key factor for the much-needed poverty reduction and economic developing world. The emergence of cloud computing is enabling vendors in Nigeria to build services on cloud and customers are able to deploy services from multiple providers with fewer complications and less risk of integration issues. A collaborative environment in cloud computing enables vendors to respond to current cloud challenges, and future cloud technology will become a viable option for averagely sized firms that are yet to embrace the cloud (Abba, 2014). A rich environment in the cloud will force interplay of competition and cooperation in the technology industry, thereby enabling cloud providers to

produce services catering to specialized needs. The state of Nigeria in the cloud ecosystem is further analysed in the next section.

Consumers: emerging businesses and companies who utilizes online services and database such as banks, firms, academic libraries and their parent oganisation and government ministries in Nigeria constitutes the cloud ecosystem's consumer that utilizes the cloud infrastructure majorly for their day-to-day activities (Dahunsi and Owoseni 2015). In a country with a population of more than 187 million people, the offerings can boost the productivity and provide improved services to most if not all. Some of the many things the cloud can offer to consumers in Nigeria includes:

i. Bridging the digital divide;
ii. E-services such as e-finance, e-commerce, e government, Telemedicine and E-medicine Selective Dissemination of Information (SDI) amongst many others;
iii. Research and Collaborative purposes;
iv. Reduction in Environmental degradation by using e-communication and e-learning;
v. Disaster recovery and emergency response;
vi. Storage capabilities.

Infrastructure: one major challenge faced by cloud computing in the country is lack of adequate infrastructure on which the cloud runs such as electricity, fast internet connectivity, backbone networks etc. Availability of electrical power in the country is also a major problem which is why minimal data centers are being planted in the country (Dahunsi and Owoseni 2015). Most consumers and third-party vendors prefer to partner with data centres outside the country with guaranteed infrastructure than with ones within the country or at least have a

backup with data centers abroad. Lack of adequate infrastructure affects the expansion and installation of data centers all over the country.

The data centres within the country are concentrated in Lagos where there is a lot of backbone access due to its proximity to the sea and a landing point to backbone solution providers who provide fibre optic interconnection worldwide (Ogunruku, 2014). The backbone network presently in Nigeria is mainly made up of wireless connections which are limited and more error prone compared to wired connections. The government needs to ensure that an adequate broadband network is available and assessable to most Nigerians. There is also insufficient internet penetration in the country. No hardware IT infrastructure manufacturing company is located within Nigeria, therefore every infrastructure required have to be imported into the country. Engineers and skilled personnel within the country are not trained first hand but rather most are trained by other trainers. Most cloud solution and service providers in Nigeria are Third-party vendors and they serve as intermediaries between end users and the source providers of cloud services.

Some of the following suggestions were provided by many researchers as possible solutions to the mentioned challenges encountered at the cause of adoption of cloud computing: To ensure self-reliance in the ICT cloud computing it is important that there should be skilled work force in ICT field. This might be challenging to obtain because firstly, there is huge brain drain in Nigeria, particularly amongst citizens working abroad in ICT related fields. There is poor funding of academic and research institutions (Cenon, 2012).

Building Infrastructures: The government should make ICT one of its priorities in the area of developmental growth so that they can invest into technological growth of the country thereby improving on the availability of power supply which is the major backbone of ICT. With efficient power supply the cloud providers will implement data centers in the country

with faster access rate instead of accessing it from a distance country (Dahunsi, M. and Owoseni, T. M., 2015).

Availability of user devices and ICT devices: Thin and thick clients are user devices which are required tools to access the cloud and make use of the opportunities and services it is offering. The government should encourage investors to establish ICT manufacturing companies to cater for more than 100 million potential users of the cloud in the country (Abba, 2014).

Research and Development: Increase in research activities in cloud computing should be encouraged in research institutions by sponsoring research grants and scholarships to postgraduate students interested in the area for research. Research fellows in Cloud Computing could also be sponsored to research facilities where they have established hardware infrastructure and software exposure and capabilities (Dutta, 2017). Academic institutions in the country should be encouraged to have cloud network laboratory in their universities and teach it to students and all interested. Workshops and Seminars can also be organized with experts in the fields. Cloud computing is one of the major secrets to enrooted of ICT and increase in internet penetration to rural places of the country (Sultan, 2010).

Regulating bodies: There should be adequate regulatory bodies established by the Government to ensure quality of cloud services and these have to be backed by Government laws and policies. The Government has to be the major diver of cloud computing in Nigeria for it to have an established and lasting footing and for clients to take optimal advantage of cloud services (Abba, 2014). Despite all these, cloud computing still remains a challenging technology peculiar to Nigeria in particular. This is borne out of the fact that Nigeria falls short of the basic IT infrastructure requirements (such as steady electricity, and poor internet connectivity) for the effective adoption of the technology.

2.8 Challenges for Adoption of Cloud Computing

Some of the most challenging issues in cloud technology are data security, resource ownership and privacy. presently, there are no available guidelines on what produce, how to produce and for whom to produce on the internet with regards to cloud deployment (Dutta, 2017). According to Babu, Sarma, Vijaylakshmi, and Kalyankar (Babu, et.al 2012) in their research on "improving the confidentiality of data stored in the cloud" proposed the need to ensure honesty and integrity from cloud service providers. This is to protect the privacy of users and effectively manage the integrity of educational data (Thomas, 2014). Most technologies are often easy but times users find it hard to adopt due the processes involved and the issue of technophobia (Adams, 2012).

Data security has consistently been a major issue in IT. Data security becomes particularly serious in the cloud computing environment, because data are scattered in different machines and storage devices including servers, PCs, and various mobile devices such as wireless sensor networks and smart phones. Data security in the cloud computing is more complicated than data security in the traditional information systems. To make the cloud computing be adopted by users and enterprise, the security concerns of users should be rectified first to make cloud environment trustworthy. The trustworthy environment is the basic prerequisite to win confidence of users to adopt such a technology Latif (2014). Cloud computing can save an organization's time and money, but trusting the system is more important because the real asset of any organization is the data which they share in the cloud to use the needed services by putting it either directly in the relational database or eventually in a relational database through an application.

Despite all the benefits that cloud technology provides, the level of acceptability still experiences several challenges. These challenges include data security, integrity of service providers, data privacy, data ownership etc. According to (Mercie, 2015), stated that the age of globalization is here and libraries and librarians must evolve or die. She concluded that "...if you can't use a computer, you can't be a librarian". Because cloud computing has now replaced software, though, not entirely. However, it important to note that, according to Moore (2014) "…we must struggle not only to improve our libraries and services but, in many cases, just to stay in business. It's a struggle that many libraries are losing, and that many more will lose unless we improve our relations with our users using whatever technology possible..."

Carl Grant (2017) at the ALA annual conference in Anaheim opined that these "new Cloud computing platforms are the technological foundations of that great age of librarianship. They're going to let us define new and better librarianship-based services that will truly give us the capability to differentiate ourselves from other information end-user services". It is therefore necessary to note that guidelines on how the technology should be adopted must be followed in order to achieve maximum benefits of the technology. Cloud computing come along with-it numerous features which deserve a kin attention such as issues of trusting the system. The trust of the entire system depends on the data protection and prevention techniques used in it. Numerous different tools and techniques have been tested and introduced by the researchers for data protection and prevention to gain and remove the hurdle of trust but there are still gaps which need attention and are required to be lined up by making these techniques much better and effective. However, it is important to note that majority of the impediments are personal and therefore can easily be mediated through sensitization, training and encouragement. Therefore, all is not lost and the potential for cloud computing adoption and use will continue to grow uninterrupted.

2.9 Summary of the Research Gap

This chapter explored in depth the related literatures on the adoption and use of cloud computing for library services. This was done under four themes viz, the need for adoption; the perceived areas where of cloud computing can be deployed; the extent of usage of the technology and presumed challenges to be faced towards adoption and appropriate utilization of cloud computing. While there exists literature on cloud adoption in libraries, there is limited mention of existing acceptability levels of cloud computing by librarians. The challenges encountered in cloud adoption in academic libraries for growing economies like Nigeria is also lacking in the reviewed literature. Also, despite the existence of adoptions of cloud computing by libraries, there is no universally agreed framework on what to adopt and what not to adopt by academic libraries.

In view of the above, this research aims at exploring the issues surrounding acceptability levels and use of cloud computing for effective library services by librarians in order to determine the existing acceptability levels and practices, challenges of adoption, potential areas where cloud computing can be deployed to enhance effective services and propose sustainable adoption research framework. By and large, it has been revealed that much works has been done in this area of cloud computing and its application for effective library services, but, there are very few works done in Nigeria and particularly academic libraries. This revelation has offered the opportunity for the researcher to fill the missing gap with information on adoption of cloud computing for effective library services in academic libraries of Kaduna state, Nigeria.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section was organised into the following broad sub-headings: research design, variables, research methodology, location of the study, population of study, sampling techniques, sample size, research instruments, validity and reliability of data collection instruments, data analysis, data collection technique and logistical and ethical considerations.

3.2 Research Design

According to Ekeh (2013) a survey research design observes both large and small populations, and by way of choosing and studying samples selected from the population, it allows to find out the relative occurrence, distribution and interrelations of variables. Descriptive survey design was used due to its consistency quantitative data and statistically analyses the facts to describe tendencies about responses to questions and to analyse research questions or hypotheses (Creswell, 2015). Survey design is consistent with post-positivism paradigm, which is pluralistic and allows the application of mixed methods. It is beneficial to use when researchers seek to collect data quickly and economically, study attitudes, behaviours and opinions as well as to survey individuals that are geographically dispersed.

This is consistent with the present study, because the institutions upon which the present study is based are dispersed in different parts of Kaduna States of Nigeria, zone 1, zone 2 and zone 3 respectively. Survey design permits the researcher to summarize the characteristics of different groups and to measure their attitudes and opinions towards knowledge management (Donald et al., 2006). The reason for using survey design was to allow for the collection of empirical data from the sample drawn in the three academic libraries using questionnaires, interviews, and to analyse the data statistically to describe the state of acceptance and use of cloud

computing in the academic libraries. Survey studies describe trends in the data rather than offering rigorous explanations.

3.3 Population of the Study

The population for this study was all the librarians from the six (6) selected university libraries in Lagos State. There are One Hundred and Thirty (130) librarians across the selected university libraries in their various sections. The population of the librarians is presented in Table 3.1 below:

Table 3.1: Study Population according University Libraries

S/N	University	Librarian
1	University of Lagos, Akoka	32
2	Lagos State University, Ojo	25
3	Lagos State University of Science and Technology	21
4	Lagos State University of Education	17
5	Pan-Atlantic University, Lagos	18
6	Caleb University, Lagos	17
	Total	**130**

3.4 Sample Size and Sampling Technique

Convenience sampling method was used to draw the sample size of the librarians in the selected university libraries. The librarians were identified at their duty post based on convenient, accessibility and availability during data collection. Kumar (2018) stated that "if a study population is small and less in number; it may be preferable to do a study of everyone in the population, rather than drawing out a sample". The determination of the sample size will be based on Krejcie and Morgan Sample Size Determination Table for ±5% precision level and 95% confidence level. (Krejcie and Morgan (1970), Israel, (2013). The total population of

respondents is 130 therefore; the sample size for this population across all university libraries was 97 which represent 95% of the total population.

3.5 Research Instrument(s)

The research instrument adopted for this study was questionnaire. The questionnaire titled: 'librarians' acceptability levels and use of cloud computing for library services in academic libraries of Lagos State, Nigeria' was designed in a way that it elicits the needed information from the librarians in this study. The survey questionnaire comprises a closed-ended questionnaire, and the questionnaire is mainly for librarians in the selected university libraries in Lagos State, Nigeria. The questionnaire consists of four (4) sections as analysed: Section A: deals with the demographic profiles of the respondents, it elicited information on the demographic characteristics of librarians. Section B: explored the rationale for adoption of cloud computing in academic libraries of Lagos State; Section C: identified the perceptions of librarians on cloud computing in the academic libraries of Lagos State; and Sections D: highlighted the challenges of cloud computing adoption in academic libraries of Lagos State.

3.6 Validity and Reliability of the Instrument(s)

The validity refers to the extent to which a test measures what it is supposed to measure. The validity of a test is therefore dependent on the purpose. For face and content validation, the instrument was given to the researcher's supervisor. The supervisor's correction and observation were incorporated before final draft of the instrument. The researcher administered thirty (30) copies of the questionnaire to thirty (30) librarians from Kwara State University for test and re-test reliability measurement. Reliability is about the consistency of a measure, and validity is about the accuracy of a measure, the validity of an instrument is the degree to which an instrument measures what it intended to measure (Cresswell, 2015).

3.7 Method of Data Collection

Due to the expansive nature of the research locale, the researcher engaged four research assistants to collect data on his behalf in the various university libraries due the location and assistants' knowledge of the respondents'. Prior to embarking on the research, the researcher had discussed and briefed the research assistants on the purpose, procedures and objectives for carrying out the research. What was emphasized during the discussion were basically on effective administration of questionnaires and retrieving of the questionnaires.

3.8 Method of Data Analysis

The data collected for this study were collated and subjected to comprehensive data analysis using the IBM Statistical Product and Service Solution (SPSS) software version 26.0. The descriptive statistics includes the frequency counts, percentages, mean and standard deviation. Tables will be used for results presentation and interpretation.

3.9 Ethical Considerations

Ethical consideration was made to avoid encroaching on the respondent's privacy and freedom by giving them time to fill in the questionnaire, maintain confidentiality of information which was ensured by not requesting of their identity. All works are cited are acknowledged in references using APA style 6th edition to avoid plagiarism. Logistically, the researcher has obtained clearance for this study from the institutions under study. Ethics in research is premised on the fact that researchers are genuinely concerned with impacting positively on other peoples' lives and are not motivated by personal gain, in addition to the fact that there are laws which prohibit certain research practices (Mugenda and Mugenda, 2003). Ethics is therefore, meant to protect the rights and welfare of participants and researchers. This study endeavored to apply all the relevant ethical principles at all levels of the study (research design, sampling, data collection and analysis).

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents the analysis, interpretations and discussions of the findings. The chapter was organized in accordance with the specific objectives of the study as well themes derived from the research questions. The purpose of the study was to assess the acceptability levels and benefits of cloud computing in academic libraries of Lagos State, Nigeria. Data were collected through semi structured questionnaires from the respondents.

4.2 Respond Rate

The response rate from each of the institution under study ranges from 20% to 59% according to the institutions respectively. The study targeted a total of 97 respondents out of a total of 130 population. A set of 97 questionnaires therefore were distributed to the librarians across the selected university libraries under study. A total of 90 out of 97 questionnaires were filled and returned reflecting 92.8% overall response rate. Details are shown in figure 4.1. According to Mugenda and Mugenda (1999), a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. This means that the response rate for this study which was recognized to be 92.8% was excellent and therefore enough for data analysis and interpretation.

4.3 Demographic Details of the Respondents

Table 4.1: Demographic Information of the Respondents

Age	**Frequency**	**Percentage**
30 years and below	24	26.6
31 – 40 years	26	28.8
41 – 50 years	22	24.4
51 – 60 years	12	11.1
61 years and above	6	6.6
Total	**90**	**100.0**
Gender	**Frequency**	**Percentage**
Male	66	73.3
Female	24	26.6
Total	**90**	**100.0**
Qualification	**Frequency**	**Percentage**
BLIS	46	51.1
MLIS	29	32.2
PhD	15	16.6
Total	**90**	**100.0**
Work Status	**Frequency**	**Percentage**
Assistant Librarian	21	27.7
Librarian II	15	16.6
Librarian I	14	15.5
Senior Librarian	12	13.3
Principal Librarian	12	13.3
Deputy University Librarian	10	11.1
University Librarian	6	6.6
Total	**90**	**100.0**
Work Experience	**Frequency**	**Percentage**
1 – 5 years	25	27.7
6 – 10 years	32	35.5

11 – 15 years	17	18.8
16 – 20 years	10	11.1
21 years and above	6	6.6
Total	**90**	**100.0**

Table 4.1 shows the age range of the respondents which are 26(28.8%) were 31-40 years, 24(26.6%) were 30 years and below, 22(24.4%) were 41-50 years, while 12(11.1%) were 51-60 years and 6(6.6%) were 60 years and above. The table also showed the gender of the respondents, 66(73.3%) were male and their female counterpart were 24(26.6%). In the qualification unit, 46(51.1%) of the respondents holds BLIS, 29(32.2%) holds MLIS, and 15(16.6%) holds PhD. Furthermore, majority of the respondents were Assistant Librarians with 21(27.7%), followed by 14(15.5%) were Librarian I, 15(16.6%) were Librarian II, 12(13.3%) were Senior Librarians, while 12(13.3%) were Principal Librarians, 10(11.1%) were Deputy University Librarians and 6(6.6%) were University Librarians. Lastly, the table showed the years of work experience of the respondents, 32(35.5%) has 6-10 years of work experience, 25(27.7%) has 1-5 years of work experience, 17(18.8%) has 11-15 years of work experience, 10(11.1%) has 16-20 years of work experience and 6(6.6%) has 21 years and above of work experience.

4.4 Analysis of Variables

Research Question 1: What is the rationale for adoption of cloud computing in academic libraries of Lagos State?

Table 4.2: The rationale for adoption of cloud computing in academic libraries.

Options	N	Mean	Std. Deviation
Significant and unified presence on the institutional web repositories.	90	1.73	.577
Cloud computing saves time.	90	1.87	.640
Cloud computing saves cost.	90	1.83	.838
Cloud computing simplify workflows.	87	1.70	.631
Meet growing information need of large student.	87	1.56	.499
Makes work faster and much easier.	87	1.61	.491
Cloud computing keep pace with technological advancement.	86	1.98	.797
Cloud computing provides opportunity for collaboration and cooperative Intelligence.	90	1.80	.640
Cloud computing provides an avenue for the removal of local storage.	90	2.30	.988
Cloud computing make work more effective and efficient.	90	1.89	.841
Others specify.	14	1.93	.616

Table 4.2 evaluate librarians' rationale for adoption of cloud computing in academic libraries, questionnaire was composed of eleven statements regarding general perceptions of cloud computing in the academic libraries. This means cloud computing has helped in time saving, information delivery efficiencies, effective information storage and retrieval so also library cooperation and intelligence for better decision –making in the academic libraries of Kaduna state. It also creates a platform for innovation and sharing of intellectual conversations, ideas and knowledge.

Research Question 2: What are the librarians' perceptions of cloud computing among academic libraries of Lagos State?

Table 4.3: The librarians' perceptions of cloud computing among academic libraries.

Options	N	Mean	Std. Deviation
Cloud computing facilitate quick access to data.	90	1.79	.662
Cloud computing improves quality of library services.	90	1.68	.615
Cloud computing helps in high storage capacity.	86	2.08	.923
Cloud computing technologies helps in easy information dissemination.	83	1.69	.539
Cloud computing reduce space management problems.	88	2.26	1.056
Using cloud computing technologies will create data security problems.	90	2.20	.851
Transfer the operation and services of library to the cloud will reduce costs.	90	2.18	.955
Duplication of efforts in collection management are minimized and network services sharing is optimized.	90	1.68	.470
Comparative intelligence and improved service levels enabled by the large-scale aggregation of data use.	81	2.22	.935
Cloud computing can help libraries collaborates with each other in a facile manner.	86	2.14	.960
Cloud computing frees libraries from managing technology so they can focus collection building.	90	2.28	.995
Cloud computing provide remote access to information everywhere you go.	86	2.17	.960
Cloud computing results in the security enhancement.	90	1.96	.702
The adoption of cloud computing technology at the library helps to activate new services.	90	2.16	.847

Table 4.3 attempted to find out what the libraries stand to benefits in the adoption of cloud computing technology which has helped the libraries in improving the quality of services to its users. This means cloud computing has helped in facilitate quick access to data, improves

quality of library services, helps in high storage capacity and help libraries collaborates with each other in a facile manner in the academic libraries of Kaduna state.

Research Question 3: What are the challenges of cloud computing adoption inacademic libraries of Lagos State?

Table 4.4: The challenges of cloud computing adoption in academic libraries.

Options	N	Percentage
Epileptic power supply.	79	87.7%
Slow internet connection.	79	87.7%
Lack of technical skills in hampering efficient use of cloud computing in the library.	76	84.4%
Age can affect the use of cloud computing to reader library services.	76	84.4%
Irregular staff training and development.	79	87.7%
Data integrity.	87	96.6%
Data privacy.	87	96.6%
Data ownership.	90	100%
Others specify.	79	87.7%

Table 4.4 highlighted the challenges librarians encountered in the cause of adoption of cloud computing. The questionnaire was composed of ten statements regarding challenges of cloud computing in the academic libraries. It indicates that the greater percentage of the respondents 76% and above (Mean score ranges from 1.56 to 2.36) and a Standard deviation range from .499 to 1.186 of each item agreed or strongly agreed that all the factors significantly influenced adoption of cloud computing.

4.5 Discussion of Findings

Findings indicates that the results from 90 respondents from the selected university libraries in Lagos State. Almost all the respondents 100% (Mean score ranges from 1.56 to 2.30) of each item agreed or strongly agreed that all the rational factors significantly influenced adoption of cloud computing. It also shows that all the options below are the needs which necessitated the

adoption of cloud computing in academic libraries of Lagos State. The finding agrees with Goldner (2012), Buyya (2014) and Yuvaraj (2015) who stated that the need behind libraries going cloud computing was to " simplify workflows, meet growing information need of large student, makes work faster and much easier, Cloud computing keep pace with technological advancement, cloud computing provides opportunity for collaboration and cooperative intelligence, Cloud computing provides an avenue for the removal of local storage, Cloud computing make work more effective and efficient, Building significant and unified presence on the institutional web repositories".

Findings also indicates the results from 90 respondents from the 3 academic libraries in Kaduna State. Almost all the respondents 100% (Mean score ranges from 1.68 to 2.28) and a Standard deviation range from .470 to 1.056 of each item agreed or strongly agreed that all the factors significantly influenced acceptability of cloud computing. These results are similar to the findings of Geoffery (2013), Gbaje and Aliyu (2014) found that "with the adoption cloud computing academic libraries stand the chance to benefits from a variety of services such as information storage, sharing, retrieval and other different approaches of use". Cloud computing enables organizations to deliver support applications and avoid the need to develop their own IT systems. Other benefits include, cooperative intelligence and improved service levels enabled by the large-scale aggregation of data use. Thus, Goldner (2013), agreed that library community can apply the concept of cloud computing to amplify the power of cooperation and build a significant, unified presence on the web.

Lastly, findings revealed that, it is evident that those challenges still affect the adoption of cloud computing in the academic libraries of Lagos State. This is in harmony with the study of Latif (2016) "which discussed the assessment of cloud computing risks. He propounded that, data storage, data protection and security are the primary factors for gaining user's trust and making

the cloud technology successfully used". The finding tallies with that of Breeding (2012) whose study on challenges affecting the implication of cloud computing in developing countries noted that the use of cloud computing in the libraries is challenged with inadequacies funding, training of staff, recruiting the right staff to do the right job, privacy, security of data among others.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes fundamental issues as established in the entire study and also makes relevant conclusions and recommendations based on policy, best practice framework and further research. These are derived from the purpose, objectives and research questions of the study. The purpose of the study was to evaluate librarians' acceptability levels and use of cloud computing for library service in university libraries in Lagos State, Nigeria and suggest areas where improvement of services ca be made.

5.2 Summary

The following are the issues established by the study:

i. Perception on the need for adoption of cloud computing: The need for the adoption of cloud computing in the academic libraries of Lagos State was to provide information to the members of the academic community who are spread across the state and to equally make the information accessible remotely. Others includes cooperative intelligence and improved service levels enabled by the large-scale aggregation of data use as well as minimizing duplication of collections. However, librarians in this study acknowledged the fact that most of them used cloud-based tools over traditional software to accomplish their work. The analysis reveals that, in general, 100% per cent of the librarians have agreed with the idea of the adoption of cloud computing by their academic libraries. It can be concluded that, due to the inherent benefits of cloud computing, librarians have adopted the technology.

ii. Librarians' general perception of cloud computing: The study revealed that a good number of the librarians are of the view that cloud computing has the ability to address

some of the many challenges facing the library services in the era of technological advancement. This means that cloud computing has the potential to positively contribute to the growth and development, effective and efficient library services. The findings of the study also revealed that librarians are using cloud-computing tools in their daily works. They want to adopted cloud computing in the libraries to improve library services and avoid redundancy of works. Ubiquitous availability, economy and the various service layers are the core drivers of its adoption in the libraries. The respondents showed their concern over security and data privacy in cloud.

iii. Challenges faced with adoption of cloud computing: Despite all the benefits that cloud technology provides, the level of acceptability still experiences several challenges. The study revealed that these challenges include data security, integrity of service providers, data privacy and the problem with data ownership. “Cloud computing comes with its own set of standards, terminology and best practices that can be difficult to manage within the traditional information security context. Although the Cloud computing industry does not yet have any regulatory body, it is being governed by Internet regulations. Still, operations face problems like data security, ownership, location, privacy and intellectual property”.

5.3 Conclusion

It is an established notion that library automation via the cloud is an unavoidable phenomenon for libraries as long as they (libraries) want to keep-up with technological innovations and meeting their obligations as information providers. Traditionally, libraries have tried to automate their system purchasing servers and software, installing, updating and configuring them. Each software product has its own design and defined workflows to meet its primary objectives. The results of the present research indicate that librarians are using cloud computing applications in academic libraries. However, librarians are also worried about data ownership,

privacy, security and legal jurisdiction in the cloud which have remained the major tailbacks in its adoption. For libraries to be continually relevant, the need to continue to use the cloud technology to render library service is paramount. By and large, it will continue to give libraries to opportunity to make information more accessible than at any other time in history, thus meeting their obligations as information providers.

5.4 Recommendations

i. There should be adequate regulatory bodies established by the Government to ensure quality of cloud services and these have to be backed by Government laws and policies.

ii. The Government has to be the major driver of cloud computing in Nigeria if it is to have a lasting footing and for academic libraries to take optimal advantage of cloud service.

iii. Technological advancement may not transform the cloud into a mainstream technology.

iv. To motivate the expansion of cloud computing adoption, emphasis has to be laid upon collaboration between the cloud service providers supplemented by solid cloud legislations which need to be worked out.

v. One major challenge of the cloud is privacy issues. It is therefore necessary to read the terms of service carefully with due diligence. Librarians must make sure that they are not signing into anything they are not comfortable with.

vi. To develop an effective and efficient cloud-based library, there is a need of librarian training and practice to address the issues of cloud realities.

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APPENDIX

QUESTIONNAIRE ON:

EVALUATION OF LIBRARIANS' ACCEPTABILITY LEVELS AND USE OF CLOUD COMPUTING FOR LIBRARY SERVICES IN ACADEMIC LIBRARIES OF LAGOS STATE, NIGERIA.

Dear respondent,

I am a student of the Department of Library and Information Science, Institute of Information and Communication Technology, Kwara State Polytechnic, Ilorin. I am currently undertaking research project titled: **"*Evaluation of Librarians' Acceptability Levels and Use of Cloud Computing for Library Services in Academic Libraries of Lagos State, Nigeria***". I therefore, request you to kindly provide your opinions to the questions as contained in the attached questionnaire. Information provided in this questionnaire will be held confidential and used for research purpose only.

Your quick response will be highly appreciated.

Thanks for your anticipated cooperation.

ADEBAYO, Rokib Adedayo

Researcher

SECTION A:
Demographic Data

Specify by ticking the right option

Please indicate your university library:

University of Lagos, Akoka	[ ]
Lagos State University, Ojo	[ ]
Lagos State University of Science and Technology	[ ]
Lagos State University of Education	[ ]
Pan-Atlantic University, Lagos	[ ]
Caleb University, Lagos	[ ]

Age: 30 below [ ]; 31-40 [ ]; 41-50 [ ]; 51-60 [ ]; 61 above [ ]

Gender: Male [ ]; Female [ ]

Qualification: BSc [ ]; MSc [ ]; PhD [ ]

Work Status: Assistant Librarian [ ]; Librarian II [ ]; Librarian I [ ]; Senior Librarian [ ]; Principal Librarian [ ]; Deputy University Librarian [ ]; University Librarian [ ]

Work Experience: 1-5 [ ]; 6-10 [ ]; 11-15 [ ]; 16-20 [ ]; 21 above [ ]

SECTION B:

What is the rationale for adoption of cloud computing in academic libraries of Lagos State?

Keys: SA=Strongly Agree, A=Agree, D=Disagree, SD=Strongly Disagree

S/N	Options	SA	A	D	SD
1.	Significant and unified presence on the institutional web repositories.				
2.	Cloud computing saves time.				
3.	Cloud computing saves cost.				
4.	Cloud computing simplify workflows.				
5.	Meet growing information need of large student.				
6.	Makes work faster and much easier.				
7.	Cloud computing keep pace with technological advancement.				
8.	Cloud computing provides opportunity for collaboration and cooperative Intelligence.				
9.	Cloud computing provides an avenue for the removal of local storage.				
10.	Cloud computing make work more effective and efficient.				
11.	Others specify.				

SECTION C:
What are the librarians' perceptions of cloud computing among academic libraries of Lagos State?

Keys: SA=Strongly Agree, A=Agree, D=Disagree, SD=Strongly Disagree

S/N	Options	SA	A	D	SD
1.	Cloud computing facilitate quick access to data.				
2.	Cloud computing improves quality of library services.				
3.	Cloud computing helps in high storage capacity.				
4.	Cloud computing technologies helps in easy information dissemination.				
5.	Cloud computing reduce space management problems.				
6.	Using cloud computing technologies will create data security problems.				
7.	Transfer the operation and services of library to the cloud will reduce costs.				
8.	Duplication of efforts in collection management are minimized and network services sharing is optimized.				
9.	Comparative intelligence and improved service levels enabled by the large-scale aggregation of data use.				
10.	Cloud computing can help libraries collaborates with each other in a facile manner.				
11.	Cloud computing frees libraries from managing technology so they can focus collection building.				
12.	Cloud computing provide remote access to information everywhere you go.				
13.	Cloud computing results in the security enhancement.				
14.	The adoption of cloud computing technology at the library helps to activate new services.				

SECTION D:
What are the challenges of cloud computing adoption in academic libraries of Lagos State?

Keys: SA=Strongly Agree, A=Agree, D=Disagree, SD=Strongly Disagree

S/N	Options	SA	A	D	SD
1.	Epileptic power supply.				
2.	Slow internet connection.				
3.	Lack of technical skills in hampering efficient use of cloud computing in the library.				
4.	Age can affect the use of cloud computing to reader library services.				
5.	Irregular staff training and development.				
6.	Data integrity.				
7.	Data privacy.				
8.	Data ownership.				
9.	Others specify.				