

**SELF-EFFICACY AS A FACTOR INFLUENCING LIBRARIANS' USE OF  
CLOUD TECHNOLOGIES FOR BUILDING COLLABORATIVE  
LIBRARIES IN NIGERIA**

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**JULY, 2021.**

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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF  
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LIBRARY AND INFORMATION SCIENCE.**

**JULY, 2021.**

## CERTIFICATION

We the undersigned hereby certify that this work was carried out by Emerie GABRIEL with matriculation number **EDU1603087** under the supervision of Mrs M-G Ekhurutomwen for the Award of Bachelor of Science degree in Library and Information Science (BLIS) in the Department of Educational Management, Faculty of Education, University of Benin.

Signed

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**Mrs, M-G Ekhurutomwen**  
**Project supervisor**

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**Dean, Faculty of Education**

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Date

## **DEDICATION**

This work is dedicated to God Almighty, whose continuous love, mercy and grace brought me this far.

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The researcher deepest gratitude goes to God Almighty for his grace, strength and blessings throughout his research work to complete the research successfully despite the difficulties encountered during the course of the program.

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## **ABSTRACT**

This study is focused on the self-efficacy as a factor influencing librarians' use of cloud technologies for building collaborative libraries in Nigeria. Professional Librarians from university libraries in Edo and Delta States in Nigeria were used for this study. The specific purpose of the study was to identify the different cloud technologies used by librarians to build collaborative libraries in Nigeria, examining the level of use of the cloud technologies for building collaborative libraries in Nigeria, investigate the influence of self-efficacy on librarians' use of cloud technologies for building collaborative libraries in Nigeria and to find out the problems facing the use of cloud technologies for building collaborative libraries in Nigeria.

A descriptive survey research design was employed for the study and a total of 120 copies of the questionnaires were distributed to the respondents and 100 questionnaires were retrieved and found usable, resulting to 83% response rate using a total enumeration sampling technique. The instrument for data collection that was used was the questionnaire, the instrument developed in accordance with the research questions were validated by the researcher's supervisor. Analyses and discussion of data collected for this study were analyzed using descriptive statistics; frequency percentage.

The study revealed that Amazon, Google Drive, Apple i-Cloud, I Drop-Box , Slack, Web-OPAC, Adobe Creative Cloud and Flickr are cloud technologies used by librarians to build collaborative libraries and the level of satisfaction derived from using cloud technologies for building collaborative libraries is very high. It was recommended among others that; University management should ensure that a power plant is installed in the library to ensure steady power supply as well as equip the library with reliable internet connectivity and technology devices enough for both staff and students and they should provide training program, workshops and seminars to improve staff skills on the use of cloud technologies for building collaborative libraries in Nigeria.

# CHAPTER ONE

## INTRODUCTION

### **Background to the Study**

Libraries are undergoing transition from traditional library to a digital resource centre (giving information in various formats viz., text, image video, audio etc.). One of the big shifts can be seen in the move from print journal subscription to e-journal/ database model purchase which helped the libraries to provide better services to their patrons. Advancement in technology have led to a new concept known as cloud computing/technology. This enables the use of a network of remote servers hosted on the internet to store, manage and process data rather than a local server or a personal computer. Likewise shifting to cloud solutions gives libraries an opportunity to save time, resources, collaborate and share resources. According to Seena and Sudhier (2013), "cloud computing (CC), also known as cloud technologies, enable the migration of desktop application to web-based applications such as communication tools (Gmail, Google Calendar, and Google Talk) and productivity tools (Google Docs: text files, spreadsheets, and presentations)" (p.12). Yuvaraj (2013) defined cloud technology as "a technology in which massively scalable and elastic information technology enabled

capabilities are delivered as a service to external customers using Internet technologies”(p.14). Cloud technology is considered as the fifth generation of computing after Mainframe, Personal Computer, Client-Server Computing, and the web. In a cloud computing environment, the organization running an application does not typically own the physical hardware used for the applications, instead a subscriber copies files to the server over the Internet (Jordon, 2011).

Hayes (2008) defined cloud technology as a kind of technology which is highly scalable and use virtualized resources that can be shared by the users. Users do not need any background knowledge of the services before using it. Moreover, a user on the internet can communicate with many servers at the same time and these servers exchange information with one another. Basically, data and adoption in the cloud are available through the internet; it can also be accessed from everywhere and from any device with internet connectivity. Stroh (2009) defined “cloud technology as “the computing software and services that can be accessed via the internet rather than residing on a desktop or internal server (p.4).” In various presentations Klynveld Peat Marwick Goerdeler (KPMG) identified four different types of cloud computing, namely: Infrastructure, Platform, Applications and Services. 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 accessed with a Web browser, examples are Google Docs, Salesforce.com, whereas, Service is a ready to use services accessed with a Web browser. Mell and Gance (2011) defined each of the two-three services models thus: Software as a Service (SaaS) 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 the Cloud computing own applications on the provider's cloud infrastructure. Infrastructure as a Service (IaaS) allows users to control and manage computing resources. Cloud technology 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 computing 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. Education today is becoming completely

associated with Information Technology (IT) on content delivery, communication and collaboration.

The need for server, storage and software are highly demanding in the Universities and libraries. Whong (2014) remarked that the primary purpose of University libraries is to support University functions of teaching, learning, research and community services in ways consistent with and supportive of the institution's mission and goals. According to Tuncay (2010), library can benefit from using cloud computing technology by increasing computing performance, storage capacity, universal accessibility and cost reduction. This can help library in terms of fixed and maintenance cost reduction in the IT investment of both hardware and software as well as computer services. With cloud computing, libraries may prevent financial waste, better track staff activities, and avert technological headaches such as computer viruses, system crashes, and loss of data. When cloud computing is used in the library, this will likely have a significant impact on library services.

According to Spreeuwenberg (2012), with cloud technology, it becomes easier to access and share 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 implementation 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. Much like a common utility, one just pays for what was used, and then turn it off when one is done. The ability to have a server somewhere, to not have to worry about it, turn it up as needed, and pay for only what is used attracts a lot of people to cloud deployment (Creeger, 2009). Library community can apply cloud infrastructure to amplify the power of cooperation and to build a significant, unified presence on the Web. This approach to computing can help libraries save time and money while simplifying workflows.

To date, the main focus of libraries moving into the cloud has been due to, the need to disclose their vast collections (Gbaje and Aliyu, 2014). In order to contend with the barrage of information available in today’s society, a medium, and an educational institution such as library needs to be put in place for proper

acquisition, processing, documenting, retrieving and disseminating of information. 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. Ordi (2006) observed that these media are useful for storage of data, information, and programs for safe keeping. Gbaje and Aliyu (2014), asserted that cloud computing comes into focus when there is need for increased capacity or added capabilities of computer without investing in new infrastructure, training new personnel, or licensing new software. Users can access database resources via the internet from anywhere for as long as

they need without worrying about any maintenance or management of information technology infrastructure

According to Mavodza (2013) “libraries have stepped and are increasingly stepping into the realm of digital librarianship as well as platforms that extend IT’s existing capabilities, and this extensively depends on using the cloud”. “Demand for cloud computing services in libraries is growing along with supply and libraries in different countries are adopting cloud services” (Berry &Reisman, 2012). The term cloud computing describes how people access and manage digital information (Martin, Snowden & West, 2009). According to Hoy (2012) most cloud computing applications and infrastructure are built with the assumption that users will access them from the Internet, on multiple platforms and from anywhere in the world.

Cloud technology has sailed past the consciousness of people and everyone including libraries has used it to a larger extent. “Users who have had the experience of using Web 2.0 services like Wikipedia, Blogger, and Flickr etc. have already experienced ‘Cloud computing’, maybe unknowingly” (Abidi, 2012). Some of the heavily used Cloud computing applications in libraries are: Web mails (Gmail, Yahooemail, Sifymail), online storage systems (Skydrive, Idrive, Box.net),

Web-based office tools (Google Docs & Zoho), Web-based RSS readers (Bloglines, Google Reader), entertainment (YouTube, Flickr, Hulu), Social networking (Orkut, Facebook, hi5) and Web based useful applications: P&O (sharing large files), Adobe Photoshop Express (online photo editors), Jumpcut (edit videos online). All these activities are being performed in cloud accessible environment via any device having a Web browser with internet connectivity. There are relatively fewer research studies on cloud computing (Jaatmaa, 2010). Ambrose & Chiravuri (2010) studied the factors that influence the use of Cloud Computing in libraries. They found that two factors (awareness and attitude) are major drivers of a person's intention to use Cloud Computing. On the other hand, Saya (2010) discovered that the characteristics of Cloud Computing like scalability, cost effectiveness, accessibility and lack of security are principal factors in growth, abandonment and deferral. Jaatmaa (2010) examined the implementation level of cloud computing technologies in libraries in the United Kingdom. They found that many libraries in developed countries have already embraced fully the adoption of cloud computing technologies in their libraries, while many libraries in developing countries use cloud computing services without even knowing it. However, despite the importance of cloud technologies for building collaborative libraries, preliminary

investigation have revealed a low usage of cloud technologies for building collaborative libraries in Nigeria. This could however be attributed to the self-efficacy and perception of librarians.

Self-efficacy is a person's belief in their ability to accomplish some specific goal or task. It generally corresponds to the level of competence an individual feels. Competence can vary from one situation to another. For instance, a person might feel quite capable competing in a particular sport but may not feel competent speaking in front of a group. As a result, overall self-efficacy may not be completely accurate as it is assessing an individual's general feelings of competence across a variety of situations or tasks. Aside from these various psychological factors definitions, the study itself will focus on how they affect undergraduates' use of library information available in their various institutions. In same vain, educationists are becoming aware of the fact that an individual's self-efficacy, or his perception of his capability or ability is related to how he learns and behaves. Many librarians have difficult in using digital technology not as a result of intelligence or physical impairment, but because they have perceived themselves as unable to do so (Edstrom, 1996). Thus, this could influence the usage of cloud technologies for building collaborative libraries. Consequently, this

study is conducted to investigate self-efficacy and perception as factors influencing librarians' use of cloud technologies for building collaborative libraries.

### **Statement of the Problem**

The 21<sup>st</sup> century is experiencing great revolution in terms of technological advancement. This has led to different institutions such as libraries adopting and using modern technologies such as cloud based technologies for collaboration and resource sharing. Resource sharing and collaboration has become increasingly important because no single library can single handedly acquire all relevant materials for their users. Consequently, many library are using different cloud based technologies to form a cooperation or collaboration.

Sadly, despite the numerous benefit associated with use of cloud computing technologies in libraries, it has however been observed that many academic libraries in Nigeria are yet to implement the use of cloud computing technologies for resource sharing and collaboration. This may be as a result of librarians' self-esteem and perception towards use of cloud technologies for building collaborative libraries. Poor self-efficacy and perception towards cloud computing technology among librarians may hinder the effective implementation

of cloud computing technologies in academic libraries in South-south Nigeria. This observation requires an empirical study to understand the situation and appropriate measures taken to ameliorate it. Consequently, this research study is set out to investigate self-efficacy and perception as factors influencing librarians' use of cloud technologies for building collaborative libraries.

### **Research Questions**

The following research questions will guide the conduct of the study:

1. What are the different cloud technologies used by librarians to build collaborative libraries in Nigeria?
2. What is the level of use of the cloud technologies for building collaborative libraries in Nigeria?
3. How does self-efficacy influence librarians' use of cloud technologies for building collaborative libraries in Nigeria?
4. What are the problems facing the use of cloud technologies for building collaborative libraries in Nigeria?

## **Purpose of the Study**

The main purpose of this study is to examine self-efficacy as factors influencing librarians' use of cloud technologies for building collaborative libraries in Nigeria. Specifically, the study is aimed at:

1. Identifying the different cloud technologies used by librarians to build collaborative libraries in Nigeria;
2. Examining the level of use of the cloud technologies for building collaborative libraries in Nigeria;
3. Investigate the influence of self-efficacy on librarians' use of cloud technologies for building collaborative libraries in Nigeria;
4. Find out the problems facing the use of cloud technologies for building collaborative libraries in Nigeria.

## **Significance of the Study**

The study will be of great benefits to librarians, library management, library users, and researchers. Librarians will benefit from this study as the findings from this study will enhance their knowledge on how self-efficacy and perception could influence their use of cloud technologies for building collaborative libraries. Also,

the study will be of significant benefit to librarians on the long run, as the findings will reveal the level of use of cloud technologies for building collaborative libraries and the recommendations from the study will help to improve library collaboration/cooperation in Nigeria.

Library management will gain from this study as the findings from this study will reveal to them whether librarians' self-efficacy and perception influence the use of cloud technologies for building of collaborative libraries in Nigeria. Also, the study will guide library management in the formulation of policies relating to library collaboration as no library is self-sufficient. This will overall enhance information services delivery in the library.

Library users will benefit from this study as the findings and recommendations from the study will lead to improved services delivery in libraries in Nigeria. The study will be of important value to library users, who as a result of the findings from this study, will receive effective services from the librarians and libraries who would have gained immensely from this study. Finally, this study will be of immense value to researchers, as the findings from this study will serve as a valuable literature for future researches in a similar subject area.

## **Scope and Delimitation of the Study**

The scope of this study will focus on identifying the different cloud technologies used by librarians for building collaborative libraries in Nigeria. Effort will be made by the researcher to investigate the level of use of the cloud technologies for building collaborative libraries in Nigeria as well as the influence of self-efficacy on librarians' use of cloud technologies for building collaborative libraries. The study will identify the problems facing the use of cloud technologies for building collaborative libraries in Nigeria.

Geographically, the study will focus on University libraries in Edo and Delta State, Nigeria. The choice of use of these libraries is premised on the fact they can easily be accessed and a good number of certified librarians are in these university libraries.

## **Operational Definition of Terms**

**Self-efficacy:** an impression that one is capable of performing in a certain manner or attaining certain goals. it is a belief that one has the capabilities to execute the courses of actions required to manage prospective situations.

**Cloud Technologies:** they refer to technologies that allows for the delivery of different services through the internet. it could include tools and applications such as data storage, servers, databases, networking and software. cloud technologies are technologies which uses hardware and software to deliver a service over a network (typically the internet), allowing users access to files and use applications from any devices that can access the internet.

**Collaborative Libraries:** this refers to cooperation and collaboration between libraries on the use of its resources and space. it entails partnership by libraries in order to strengthen services delivery and be more effective since no library is self sufficient.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

This chapter focuses on the review of related literature on self-efficacy as a factor influencing librarians' use of cloud technologies for building collaborative libraries in Nigeria. It is done under the following sub-headings:

Cloud Technologies used by Librarians to Build Collaborative Libraries

Level of Use of the Cloud Technologies for Building Collaborative Libraries

Influence of Self-Efficacy on Librarians' Use of Cloud Technologies for Building Collaborative Libraries

Problems Facing the Use of Cloud Technologies for Building Collaborative Libraries

**Cloud Technologies used by Librarians to Build Collaborative Libraries**

Mahalakshmi and Ally (2012) conducted a study to identify the awareness and implementation of cloud computing by librarians of engineering colleges of coimbatore district and found that most of the respondents (98.2%) are aware of the term cloud computing and 87.7% of the respondents are aware of the

technologies of cloud computing in libraries. Half of the respondents (52.6%) are of the opinion that it is feasible to apply cloud computing in libraries. Many studies have examined the overall concept of Cloud Computing. However, research on librarian`s awareness, usage and acceptance level of Cloud Computing is not very significant. Abidi (2012) made a survey in four different universities of Faisalabad, Pakistan to find, the awareness and implementation level of cloud computing technologies in libraries. Findings show that most of the participants are familiar with cloud computing but unfortunately some of them are not much clear due to lack of resources. 91% participants replied that they are aware of the different cloud computing technologies.

However, some studies suggest evidence of poor level of awareness among librarians on the implementation of cloud computing technologies in libraries. Alemayehu (2010) noted that it has been found that the level of awareness of librarians on the use of cloud computing in general in university libraries in Nigeria is very low. His findings revealed that librarians in university libraries in Nigeria have a very confused understanding of the ‘Cloud Computing’ concept. Librarians have not yet fully engaged in using the cloud to perform some library services.

A 2014 survey of librarians' awareness towards cloud computing technology in libraries conducted by Adewara showed that 82% of the librarians sampled knew 'nothing at all' or 'a little' about cloud computing. Rowlands, Nicholas and Huntington (2014) also carried a similar study in Ghana and found out that majority of the library professionals (42.16%) are not aware of the technology. Only 36.27% of the respondents know the technology and 21.57% of the respondents have a little knowledge. The fact realized was that the library staff members were already experienced users of cloud computing – without even knowing it. It was observed that most of the qualified library professionals don't get an opportunity to be familiar with the cloud services. The study also indicated that librarians showed a negative attitude towards cloud computing services while also having some reservations about quality and preservation in such a model.

According to Mark and shearer (2016), literature has cited a number of reasons why librarians' use and implementation of cloud computing technology in the discharge of library services are so low. At the most basic level, librarians lack awareness of the existence of cloud computing technologies and what it stands for. Several surveys have found that many academic librarians are not familiar with the concept of any cloud computing technologies on campus (Swan & Brown, 2015).

Christian (2008) noted that lack of knowledge or awareness of cloud computing technology is not peculiar with librarians, but also researchers. In fact, this is the situation in most developing country institutions. In line with the above, Dulle (2008) established that a majority of librarians had heard about cloud services. The most common terms or initiatives by librarians are information and communication technology. Most librarians claimed that they got cloud computing awareness from their colleagues, internet debate, publishers' promotion and workshops. Levels of awareness of cloud computing technology usage by librarians are varied. Mark and Shearer (2016) observed that the security and safety of the information processed and stored using cloud computing technologies are also a concern for librarians. Despite the fact that most librarians turn to web technologies for processing, dissemination and storage of information, librarians are concerned that they face security issue or they could be hacked.

### **Level of Use of the Cloud Technologies for Building Collaborative Libraries**

Libraries today have discovered the need to migrate from the print or paper form to a digital or web-based environment because of the numerous benefit associated with the used of cloud or web-based technologies. Bik and Goldstein

(2013) observed that the essential characteristics of cloud computing is on demand self-services-computer. Services such as email, applications, network or server service can be provided without requiring human interaction with each service provider. Cloud service providers providing on demand self-services include Amazon Web Services (AWS), Microsoft, Google, IBM and Salesforce.com. New York Times and NASDAQ are examples of companies using AWS (NIST). Also, Reid (2007) noted that the broad network access is a major benefit libraries derive from using cloud computing technologies. Cloud Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms such as mobile phones, laptops and PDAs.

Furthermore, Olson (2014) identified Resource pooling as one benefit institutions such as libraries enjoy while using cloud computing technologies. The provider's computing resources are pooled together to serve multiple consumers using multiple-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. The resources include among others storage, processing, memory, network bandwidth, virtual machines and email services. The pooling together of the resource builds

economies scale. The use of cloud computing technologies in libraries leads to rapid elasticity. Cloud services can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time (Onuoha, 2012). Ezeani and Igwesi (2012) opined that libraries can obtain measured services when using cloud computing technologies. Cloud computing resource usage can be measured, controlled, and reported providing transparency for both the provider and consumer of the utilized service. Cloud computing services use a metering capability which enables to control and optimize resource use. This implies that just like air time, electricity or municipality water IT services are charged per usage metrics – pay per use. The more you utilize the higher the bill. Just as utility companies sell power to subscribers, and telephone companies sell voice and data services, IT services such as network security management, data center hosting or even departmental billing can now be easily delivered as a contractual service. In addition, the use of cloud computing technologies in libraries is advocated by the Cloud Security Alliance. It refers to the need for policy-driven enforcement, segmentation, isolation, governance, service levels, and chargeback/billing models

for different consumer constituencies. Consumers might utilize a public cloud provider's service offerings or actually be from the same organization, such as different business units rather than distinct organizational entities, but would still share infrastructure (Oyekan, 2007).

Also, Kroski (2009) noted that a major benefit of implementing cloud computing technologies in libraries is its relative low cost when compared to its functionality. Cloud computing reduces paperwork, lowers transaction costs, and minimizes investment in hardware (and the resources to manage it). Implementing cloud computing in libraries also reduces the need for an IT staff. Hutton (2008) also stated that cloud computing is scalable. Like electricity and water, some cloud computing services allow businesses to only pay for what they use. And as your business grows, you can accommodate by adding more server space. In addition, Bullas (2014) explained that there are different levels of playing field when using cloud computing technologies. Cloud computing providers offers small and mid-size businesses access to more sophisticated technology at lower prices. Sharing IT resources with other companies reduces the cost of licensing software and buying servers. Similarly, Yahaya (2009) stated that the use of cloud computing technologies facilitate easier collaboration. Since services in the cloud can be

accessed anytime from any computer, it's easy to collaborate with employees in distant locations. Scalability In cloud computing refers to real time adjustment of resources. Cloud computing enables us scale up or down IT requirements of organizations quickly and efficiently, without hampering productivity. It cuts down the time involved in buying and setting up additional hardware, software & other necessary resources every time a new service is required. A lot of cost related affairs like administration, maintenance and be reduced when using cloud computing technologies in libraries. It also helps cut down unnecessary capital expenditure as one has to pay only for the duration of use the service for. This also ensures effective utilization. As in cloud computing the total IT infrastructure is as a pool of resources, it reduces wastage of resources to a great extent and improves utilization.

Beyond the basic components like hosted email services that have a strong consumer base, cloud computing can be utilized to address needs which are specific to libraries. This can be broken down into the three types of cloud services, replacing a library's onsite technology environment with an online version, and then situations where a library can create its own cloud infrastructure. These areas offer "benefits to information professionals: outsourced infrastructure, greater

flexibility, reduced barriers to innovation, and lower start up investments”. The three main types of cloud services are Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) (Kroski, 2009). First, cloud computing offers the ability of libraries to use online software to handle a task like video chat through either Gmail video chat or through Skype. Both of these are free services though there is “little customization or control available with these applications” (Kroski, 2009). In other words, services you offer through a SaaS’ interface will look like that of your competitors which will not distinguish you from them. On the other hand, since the services and application interfaces are often familiar with users, there would be a decrease in the learning curve for library staff and users. Second, libraries can create applications in an online environment. These environments allow a library to “build, test, and deploy Web-based applications” (Kroski, 2009). PaaS gives the library the freedom to explore development options without having to purchase and maintain the required infrastructure. This way, if a particular program turns out to not be popular or a best fit for a library, they are not stuck with unwanted hardware and software which they could not recoup the costs from. Third, a library no longer has to purchase their own servers to host their content. By using IaaS, a library can

purchase server space and computing power. One of the major players in this arena is Amazon which offers the “Elastic Compute Cloud (EC2), which provides computing resources and Simple Storage Services (S3) for data storage” (Kroski, 2009). A library does not need to purchase a server which is underutilized but costs the same to purchase and maintain as if it were using all of its resources at all times. By using an IaaS, a library gains the benefit of only paying for the “resources you actually use”. Therefore the main benefit for moving to a cloud computing environment for a library is the ability to both try out new software without having to buy the hardware as well as being able to scale the computing power to meet the demand of users. A library’s IT department can be more flexible in raising the amount of cloud computing they require by contacting their vendor instead of physically having to acquire new hardware to meet increased demands. This method will save the library money and staff resources.

Conclusively, Ossai-Ugbah (2012) identified some benefits library derive from the use of cloud computing technologies. These benefits includes ease of gathering different library activities, collaboration and creation of library networks, avoidance of repetition of efforts within a library, increase in the range of services offered, saving the time of the users, increases efficiency, speedy and easy access

of information, improves the quality of library services, enhance the knowledge and experience, integration within the organizations, improve the status of the library, improve the communication facilities, remote access to users, round the clock access to users, access to unlimited information from different sources, more up to date information, information flexibility to the users, reforming and combining of data from different sources and reducing the workload of the library staff.

### **Influence of Self-efficacy on Librarians' Use of Cloud Technologies for Building Collaborative Libraries**

Attitudes are “inclinations and feelings, prejudices or bias, preconceived notions, ideas, fears and convictions about any specific topic” (Taiwo, 2008). Alemayehu (2010) stated that “an attitude is a mental and neutral state of readiness organized through experience exerting a directive or dynamic influences upon individual's response to all objects or situations with which it is associated (p.21).” This study explores the response and readiness of librarians to the implementation of cloud computing technologies. Attitudes represent the conceptual value of these technologies in the minds of the librarians, not the values of the technologies

themselves. According to Spacey (2013), positive attitudes are fundamental in implementing new technologies. The Technology Acceptance Model (TAM) is another way of looking at the relationship between attitude and behaviour. Bangboye (2013) found a correlation between attitude toward technology and its implementation and use among librarians. Craghill (2008) carried out research that reinforced the importance of a positive attitude on the implementation of cloud computing technology.

A number of studies have been conducted on cloud computing and the application of the technology in libraries. Yuvaraj (2013) analyses the technology acceptance model (TAM) in order to examine the librarians' behavioural intentions to use cloud computing applications using questionnaire survey. The results indicated that librarians' perceived ease of use had significant impact on the attitude towards use. In another study, Annie (2014) also reports the finding of a study on librarian's attitude and perception of cloud computing technology in central university libraries of India using diffusion of innovation theory. The findings revealed that many librarians have a positive attitude towards the implementation and use of cloud computing technologies in the discharge of library services. Yuvaraj and Singh (2013) explained that librarians possess

different attitude towards the various open source cloud based operating systems when using the various computing activities that is installed or downloaded on traditional computers. They noted that while some prefer to use Software as a Service (SaaS), such as in library catalogues, WorldCat, Googledocs, and others; others prefer to use web Platform as a Service (PaaS) as in the use of GoogleAppEngine; or Infrastructure as a Service (IaaS) as in the use of D-Space, FEDORA, and others.

The findings of a survey of more than 300 librarians by Williams (2013) revealed a correlation between levels of use, skills, familiarity, and knowledge of ICT and librarians' attitudes. Johnson (2011) observed that a major reason for failure of the implementation of cloud computing technologies in libraries in developing countries is that librarians plan without sufficient knowledge of the purchase of hardware, software, and power supply requirements. Finlay (2016) sought to establish a connection between current knowledge and personality types in measuring librarians' attitude toward the Internet services. The researchers hypothesized that those with more knowledge and more innovative personalities were likely to have a more positive attitude toward innovation such as the usage of cloud computing technologies. The hypotheses about knowledge were supported,

but the hypothesis regarding innovativeness was not supported. Janes (2012) found that reference librarians with digital reference experience had more positive attitudes towards cloud computing usage than those who had no experience. Yaacob (2012) investigated the attitudes of librarians in government-supported special libraries in Malaysia, and examined the relationship between the librarians' attitudes toward cloud computing and other variables. A significant relationship was found among attitudes and awareness of the potential of cloud technology, recency of attaining professional qualifications, and knowledge of information technologies. Librarians' level of knowledge of technology was good predictor of attitudes toward the implementation of cloud computing technology in Libraries. Al-Zahrani (2013) investigated the perceptions of 147 library professional and paraprofessional staff concerning information technology innovations such as cloud computing in university libraries in Saudi Arabia. He found a significant relationship among respondents' educational background, experience in using information technology, and their perceptions about cloud computing.

The state of library's networking system depends on the availability and quality of electrical power and the type and distribution of electrical wiring in the library through computer network (Eric, 2012). Computers operate better and last

longer when the computer network that powers the library is continuous and of consistent voltage. Many libraries, especially academic libraries need sufficient supply of network to withstand the additional demand made by the computers (Kessler, 2013). Furthermore, networks cables may not be the correct gauge to withstand the additional load caused by computers being connected to the library's networking system according to Eric (2012). One reason why many libraries decide to install computer network in libraries is to overcome the challenges and issues of poor computer networking that may require the library to refurbish the existing network system or add a whole new network supply system which reduces the amount of electrical wiring needed. According to Jubril (2011), many libraries in developed countries have now turn their attention to cloud services using cloud computing technologies. This now enable the storage and preservation of information materials. Also, Fayemi (2013) stated that in a bid to go digital and provide cloud based services, libraries now purchase computers, especially those connected to a local area network (LAN), which require a grounded electrical system to operate smoothly and trouble-free.

According to Ajibola (2012), the level of implementation of cloud computing technology and services in libraries in Nigeria is very low. This is

because many libraries are just embarking on the use of computers to render information services and have not gone to the stage of providing cloud based services. The computer network used during the last several decades in libraries has made a massive shift from traditional concepts of "the library". The catalyst for this shift has been the computer network asserted by Kessler (2012). The use of cloud computing technologies in libraries has been developed to provide access to information promised by traditional library work. Today, developments like high-capacity networks and broadband communications offer physical access to data to average users on a level never dreamed of by the inventors of the paper-and-cardboard book or the library card catalog. And yet intellectual access to that data appears to be impeded, by lack of organization and by the inability of average users to find useful information within it. This, according to Theophilus (2013) can be attributed to poor awareness or low level of awareness of the use of cloud computing technologies by both the librarians and library users.

Krubuand and Osawam (2011) noted that many libraries in Africa are gradually accepting the use web based tools to render effective services to their users. Although level of implementation of cloud computing technology in libraries in Africa is very low when compared to those in developed countries,

where there is a widely-used web cataloging tools of OCLC which are the most prominent examples of cloud computing in the library arena. Each local library uploads its cataloging records to the shared resource center of OCLC over the web. Onuoha (2012) observed that libraries have implemented the use different web-based application in the discharge of their services. Dulle (2008) observed that some of the cloud computing applications already implemented in libraries Europe, America and some part of Asia includes:

1. Google Apps: allows migration from desktop to Web-accessible applications, such as communication tools (Gmail, Google Calendar, and Google Talk) and productivity tools (Google Docs: text files, spreadsheets, and presentations).
2. OCLC's Worldshare Management Services (WMS): allows libraries to manage entire collection management life cycle in a cloud-based application. It offers unified web based applications from acquisition and circulation to metadata and licensing management, resource sharing and analytics.
3. Ex-Libris: a leading library software vendor from USA, who initially implemented solutions as locally and at a later stage adapted them to a hosted environment. The company's next generation library system, Alma,

was conceived as a cloud-based service to transform the traditional management of library resources.

4. OSS labs: from India is using Amazon's elastic cloud computing platform and offering Koha ILS and DSpace institutional repository hosting and software maintenance subscription services for libraries.
5. Duraspace: which is a collaboration of the Dspace digital library software and Fedora Commons provide repository services for all type of libraries and also for consortia. Its new service DuraCloud offers complete solution for digital library with open source code and the code needs to be installed on your machine.
6. Dropbox: is a file hosting service operated by Dropbox, Inc., that offers cloud storage, file synchronization, and client software. Dropbox allows users to create a special folder on each of their computers, regardless of which computer is used to view it.
7. Polaris: Polaris Library Automation System, provides standard acquisition and processing system. The system uses number of well-known standards like MARC 21 for bibliographic data, XML, Z39.50 for information retrieval, Unicode etc.

Furthermore, Gbaje and Aliyu (2014) however lamented that unfortunately, in developing countries particularly in Nigeria, libraries started automating with an underdeveloped information and telecommunications infrastructure which include inadequate computer network which does not include the use of cloud computing technologies. Similarly, the use of open source library automatism software often seen as a panacea for library automation in developing countries has been very gradual in Nigeria. Reason being the dearth of its skills required for both development and maintenance of open source software, it is expensive and high storage capacity which are poorly developed or beyond the financial reach of most academic libraries. Gbaje and Aliyu, (2014) asserted that cloud computing comes into focus when there is the need to increase capacity or add capabilities of computer without investing in new infrastructure, training new personnel or licensing new software that can be built on the existing network in the library.

Technology progresses, new application emerge that offer specialized functionality on a mobile device such as phones or tablets. Often, these apps include social aspects where users share information online (Spacey, 2013). The capability of sharing data between devices is typically achieved by developing web services. Increasingly, such services are deployed in the cloud hosted environment that

offers virtualized storage and computing resources. Some many reasons were provided for the acceptance of cloud computing technology in the libraries. Erhabor (2012) pointed out that libraries moving into the cloud have been discovery services, the need to disclose their vast collections on the Web. Combining systems into a cloud environment reduces the carbon footprints, making libraries greener. These improvements can be grouped into three basic areas: technology, data and community. Each offers some general and some unique opportunities for libraries. Looking first at the technology that most current library systems employ several benefits of cloud computing solutions surface include: Cloud computing solutions at their essence are built on current technology and should be architected to allow for technology shifts. Looking at the explosion of mobile devices one sees how businesses, organizations, and libraries operating in a cloud environment are able to adapt and deliver their services to the new devices much more quickly and less expensively.

Also, Geoffery (2013) explained that the numerous benefit experienced in the use of cloud computing technologies is one of the reasons for its wide range of adoption in developed countries. Many cloud solutions offer a type of openness with published application program interfaces (APIs) that any programmer can

take advantage of. This means that if a new service or technology emerges libraries will not always be dependent on a vendor or other third party to start taking advantage of these services and technologies. Geoffery (2013) noted that existing library systems have used a set of routines, protocols and tools for building software applications. APIs to connect to external services but they have remained closed proprietary systems making it hard to integrate them into external services. This makes it possible to integrate two services once and re-use it across the community with the help of cloud computing. With the latest innovation, Ajibola (2012) noted that libraries in Africa can equally get out of the business of technology such as hardware breakdown, software problems and focus on collection building, patron services and innovation. Goldner (2012) explained that Servers can be decommissioned and no longer require replacement every five years (or less). Staff no longer has to maintain the complex software stack necessary to run local systems and worry about compatibility of the tack during upgrades. Instead technical skills can be re-deployed for extending cloud services into their environment and their environment into other cloud services. Geoffery (2013) added that when data is stored in the cloud, it offers several advantages such as common data can now be easily shared among services and users. The need for

local storage, maintenance and backups is removed. Agreements can be forged to share data that normally would be considered private to a single library or organization. He also added that libraries can achieve Web scale when they massively aggregate data and users, sometime a cloud environment makes possible.

### **Problems Facing the use of Cloud Technologies for Building Collaborative Libraries**

Christian (2008) opined that development in information and communication technology has resulted in the emergence of open access resources which is a digital archive for the dissemination and preservation of both institutional research outputs and the output of scholars around the globe. Online databases make possible wide dissemination of electronic database resources by means of the Internet. The growth of open access electronic database resources has been very remarkable in many developed countries. However, academic and research institutions in many developing countries like Nigeria are still battling to overcome many challenging issues in an attempt to effectively use electronic database resources. Christian (2008) identified inadequate information and communication technology infrastructure as one of the major problem associated with the use of electronic database resources. A major problem in this area is the high cost of

Internet bandwidth in the region as most electronic database resources requires internet connectivity to access it. This cost results from the use of satellite infrastructure for Internet connection as opposed to much efficient and cheaper fibre optic.

In addition, Erhabor (2014) noted that inadequate funding constitutes a major problem in the use of electronic database resources as many institutions in Nigeria lack the financial power to subscribe to high profile databases for their students and staff. Most of the academic and research institutions in Nigeria are funded by the government. These institutions continue to grapple with percentage decline in budgetary allocation. Considering the fact that development of electronic database resources in this part of the world is a capital intensive project, funding constitutes another obstacle to the availability and usability of electronic database resources.

In addition, Adeyemi (2012) noted that a number of challenges militate against effective utilization of electronic database resources by undergraduate student. He opined that it is embarrassing that stable power supply in the country is still a mirage till date. Agboola (2013) observed that the issue of epileptic power supply in most African countries has in no small measure affected the use of electronic

database resources by students as all electronic databases are powered by electricity but the supply of electricity in Africa is nothing to write home about”. Supporting this, Adeyemi (2012) stated that “power outages is a problem militating against information/internet provision and use in African countries”. Similarly Ossai-Ugbah (2012) claimed that “power outages increases the general overhead cost of utilizing electronic information resources, thus having a negative impact on the use of electronic database resources.

Furthermore, Onoje (2014) observed that many online databases are linked with numerous websites. To retrieve electronic journal articles in these databases, users must navigate a vast number of websites, and each publisher structures their website differently than the next. This can be very challenging because the websites are not always designed for easy navigation. Sometimes it is very difficult to determine what link on the crowded homepage leads to article content. This problem makes the use of electronic database resources difficult. Oyekan (2007) also indicated that low level of technology penetration is another problem hindering the effective utilization of electronic database resources. There is a general inadequacy in the level of technology in the Africa. This can be attributed to high cost of tariffs in the control and government negligence. Nigeria look

forward to a time when each home and every office would be connected to the internet at little or no charge as it is in developed nations. Sadly, internet connection in the country is most times available only to the rich (Ezeani&Igwezi, 2012). Ezeani and Igwesi added bandwidth problems to this, noting that most institutions have limited bandwidth to support this practice of internet connectivity. They concluded that poor connectivity can frustrate effective online participation. Other problems encountered in the use of electronic database resources are lack of technical knowledge and expertise, high cost of ICTs, corruption and negligence, little government intervention, resistance to change and a host of others.

Furthermore, McQuail (2011) stated that “lack of awareness among librarians on the use of social media for scholarly purposes is a challenge as most librarians in the developing nations are not aware of social media services, even the few that are aware are still struggling to find out the productive uses of these sites for library services and communication” (p.17). Librarians are also not aware of the protocols involved in social communication. They also noted that large percentage of librarians are possibly unaware, even some of the academic staff may be unaware that social media can be used as a tool to foster informal scientific communication among librarians around the globe. Bullas (2014) opined that “it is

important for librarians to initiate contact with fellow librarians and clients in order to experiment with developing a public self”. Ezeani and Igwezi (2012) explained that getting people and social media users (Librarians inclusive) to move beyond the social aspect of social media and to use them for more serious and productive outcome such as scholarly communication through an invisible college is often a challenge in Nigeria

Conclusively, Bik and Goldstein (2013) stated “that a very common challenge in the use of electronic database resources is the lack of technical knowhow and awareness of the full functionalities of the various databases” (p.13).

### **Summary of the Reviewed Literature**

The review of the related literature covered librarians’ awareness of cloud computing technologies in university libraries, the attitude of librarians towards implementation of cloud computing technologies in university libraries, the perceived benefits of using cloud computing technologies in university libraries.

Furthermore, the reviewed literature showed existence of a knowledge gap on the present situation of the awareness and attitude of librarians’ towards the implementation of cloud computing technologies in university libraries in South-

South Nigeria, as most of the literature reviewed were foreign (majorly from the western world). Therefore, a study on the awareness and attitude of librarians' towards the implementation of cloud computing technologies in university libraries in South-south Nigeria will help increase the amount of local literature in the subject area. This is the gap the study is set out to fill.

## **CHAPTER THREE**

### **RESEARCH METHODS**

This chapter describes the methods used by the researcher in carrying out the study. The procedures and method is structured under the following sub-headings:

Research Design

Population of the Study

Sample and Sampling technique

Research Instrument

Validity of the Instrument

Reliability of the Instrument

Method of Data Collection

Method of Data Analysis

#### **Research Design**

The study employed a descriptive survey research design to gather information on self-efficacy as a factor influencing librarians' use of cloud technologies for building collaborative libraries in Nigeria. According to Nworgu (2015), a descriptive survey design is one in which a group of people or item is studied by collecting and analyzing data from only a few people or items

considered to be representative of the entire group. This research design was chosen because it is based on the views and opinions of the respondents as well as the record available in the area of study.

### **Population of the Study**

The population of this study is 120 librarians. This consists of librarians in university libraries in Edo and Delta states of Nigeria. The figures were retrieved from the offices of the different university librarian in the university libraries in South-South Nigeria. The distribution of librarians in each university library is presented in table 3.1.

**Table 3.1 Population of the Study**

<b>S/N</b>	<b>UNIVERSITIES</b>	<b>No. of Librarians</b>
1	University of Benin	12
2	Federal university of petroleum resources, Effurun	10
3	Delta State University Abraka	14
4	Edo university, Iyamho	6
5	Ambrose Alli University, Ekpoma	16
6	Igbinedion University Okada	9
7	Benson Idahosa University	16
8	Novena University, Ogume	5
9	Samuel Adegboyega University, Ogwa.	11
10	Edwin Clark University, Ughelli	5
11	Micheal and Cicilia Ibru University	5
12	Wellspring University, Evbuobanosa – Edo State	5
13	Western Delta University, Oghara	6
<b>Total</b>		<b>120</b>

**Sources:** University librarians' office of the university libraries under review (field report, 2021)

### **Sample and Sampling Technique**

The sample size of this study is 120 librarians. The researcher adopted the total enumeration sampling technique to investigate the entire 120 librarians in the university libraries. The entire population of the study was adopted to be studied because the population is not large and there is enough time and fund to conduct the study. This is in line with Oghene and Bamgboye (2006) who opined that the entire population can be studied if the population is of a manageable size. Hence,

the researcher adopted the entire population so as to obtain accurate data and desirable level of precision.

### **Research Instrument**

The instrument to be used in this study for the collection of data is the questionnaire. A questionnaire entitled “self-efficacy as a factor influencing librarians’ use of cloud technologies for building collaborative libraries (SILUCTBCL)” was designed by the researcher. The instrument was divided into four sections, with Section A designed to obtain background information from respondents while other sections addressed the variables under study and had multiple items which were measured using a 4-point likert-like scale of strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD) and represent 4, 3, 2 and 1 point respectively.

### **Validity of the Instrument**

The instrument was validated by the researcher’s supervisor. The supervisor was requested to study the items and assess the suitability of the language, the adequacy and relevance of the items in addressing the research questions bearing in mind the purpose of the study. The corrections, comments and

observations made were used to modify the final questionnaire used for the study. This ensured face and content validity of the instrument.

### **Reliability of the Instrument**

To ensure the reliability of the instrument, the test-retest method of reliability was used to determine the consistency of the opinion of the respondents. The instrument was administered twice to 20 librarians at Federal University of Technology Library, Akure within an interval of two weeks. The Pearson Product Moment Correlation Co-efficient was used in analyzing the responses received from the librarians.

### **Method of Data Collection**

The services of three trained research assistant was employed in administering the instrument to the respondents. This enabled the researcher to cover all the areas that was used for this study. The distribution and collection of the questionnaire to the librarians in the different institution under study is expected to last for a period of six weeks.

## **Method of Data Analysis**

The data will be analysed using descriptive statistics. Frequencies will be used in analyzing the bio-data of the respondents; statistical mean will be used to answer the research questions. The criterion mean is placed at 2.50. This is because of the descriptive nature of the data. The data collected will be presented in tables for clarity sake.

## CHAPTER FOUR

### PRESENTATION OF RESULTS AND DISCUSSION OF RESULTS

This chapter presents the results and discussion of findings in line with the research questions asked. This chapter is discussed under following subheadings:

Questionnaire response rate

Analysis of the respondents' bio-data

Answering of the research questions

Discussion of findings

#### Questionnaire Response Rate

**Table 1: Questionnaire Response Rate**

Number of Questionnaires Administered	Number of Questionnaires Returned	Percentage of Questionnaires Returned
120	100	83%

A total of 120 copies of the questionnaires were distributed and 100 (83%) questionnaires were retrieved and found useful. The response rate of 83% is considered adequate for the study because the standard and acceptable response rate for most studies is 60% and above. This is also in line with Osuala (2005) who

stated that “a minimum of 60% response rate is adequate for a research study” (p.49).

### **Analysis of the Respondents' Bio-data**

#### **Gender Distribution of the Respondents**

**Table 2: Gender Distribution of the Respondents**

<b>Gender</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Male	36	36
Female	64	64
Total	100	100.0

Table 2 shows that there are more female respondents (64%) than their male (36%) counterparts. This implies that there are more female library staffs than their male counterparts in the university libraries under review.

## Age of the Respondents

**Table 3: Age Distribution of the Respondents**

<b>Age</b>	<b>Frequency</b>	<b>Percentage (%)</b>
20-30 years	10	10
31-40 years	41	41
41-50 years	33	33
51-60 years	9	9
61 years and above	7	7
Total	100	100.0

Table 3 shows that majority of the respondents in this study are within the age range of 31-40 years (41%) and 41-50 years (33%). The table also shows that only 7 library staff representing 7% of the total respondents is within the age range of 61 years and above.

## Career Status of Respondents

**Table 4: Status of Respondents**

<b>Status</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Assistant/Graduate Librarians	23	23
Librarian II	25	25
Librarian I	16	16
Senior Librarian	11	11
Principal Librarian	15	15
Deputy University Librarian	5	5
University Librarian	5	5
<b>Total</b>	<b>100</b>	<b>100</b>

Table 4 shows that 25% of the respondents are Librarian II followed by Assistant/Graduate Librarians with 23% and the next is Librarian I with 16%. This implies that there are more librarians at the lower level of the ladder.

## Working Experience of the Respondents

**Table 5: Distribution of the Respondents by Working Experience**

<b>Working Experience</b>	<b>Frequency</b>	<b>Percentage (%)</b>
1-5 years	21	21
6-10 years	36	36
11-15 years	17	17
16-20 years	15	15
21 years and above	11	11
Total	100	100.0

Table 5 shows that 36% of the respondents had spent between 6-10 years on the library profession. This is followed by 21% and 17% of them who had spent 1-5 years and 11-15 years respectively. A few of them 15% and 11% had spent 16-20 years and 21 years and above respectively. This implies that many of the respondents in this study have good number of working experience.

### Section 3 Answering of the Research Questions

**Research Question One:** What are the different cloud technologies used by librarians to build collaborative libraries in Nigeria?

Data in Table 6 provide answers to this question.

**Table 6: Cloud technologies used by librarians to build collaborative libraries in Nigeria**

Cloud Technologies	Agree		Disagree	
	No.	%	No.	%
Google Drive	81	81	19	19
Drop-Box	72	72	28	28
Slack	68	68	32	32
Adobe Creative Cloud	66	66	34	34
Apple i-Cloud	81	81	19	19
Web-OPAC	68	68	32	32
Flicker	59	59	41	41
Amazon	88	88	12	12

Table 6 shows that Amazon (88%), Google Drive and Apple i-Cloud (81%), I Drop-Box (72%), Slack (68%), Web-OPAC (68%), Adobe Creative Cloud (66%) and Flickr (59%) are technologies cloud technologies used by librarians to build collaborative libraries. This implies that there are numerous technologies used by Librarians to build collaborative libraries in Nigeria.

**Research Question Two:** What is the level of use of the cloud technologies for building collaborative libraries in Nigeria?

Data in Table 7 provide answers to this question.

**Table 7: The level of use of the cloud technologies for building collaborative libraries in Nigeria**

Item	Very High		High		Low		Very Low		Total
	N	%	N	%	N	%	N	%	
Level of Use of Cloud Computing Technologies									
Google Drive	65	65	9	9	18	18	8	8	100
Drop-Box	61	61	13	13	17	17	9	9	100
Slack	43	43	29	29	1	1	27	27	100
Adobe Creative Cloud	53	53	17	17	14	14	16	16	100
Apple i-Cloud	65	65	9	9	18	18	8	8	100
Web-OPAC	64	64	22	22	4	4	10	10	100
Flicker	41	41	31	31	15	15	13	13	100
Amazon	74	74	14	14	6	6	6	6	100

Table 7 shows that the following records and Cloud technologies are in use in a very high extent: Amazon (74%), Google Drive and Apple i-Cloud (65%), Web-OPAC (64%), Drop-Box (61%), Adobe Creative (53%), Slack (43%), and Flickr (41%). This implies that the use of cloud technologies for building collaborative libraries is to a very high extent.

**Research Question Three:** To what extent do self-efficacy on librarians’ use of cloud computing technologies for building collaborative libraries in Nigeria?

Data in Table .8 provide answers to this question

**Impact of self-efficacy on librarians’ use of cloud computing technologies for building collaborative libraries**

<b>Impact of Self-Efficacy on Librarians’ Use of Cloud Computing Technologies</b>	SA		A		D		SD		Total
	N	%	N	%	N	%	N	%	
The perceived ease of use of the cloud computing technology will enable me to adopt it.	64	64	22	22	4	4	10	10	100
I like to use cloud computing because it will enable storage and preservation of information materials	63	63	23	23	2	2	12	12	100
I feel that librarians with digital reference experience may have positive attitude towards the implementation of cloud computing technology	65	65	9	9	18	18	8	8	100
I perceive that librarians knowledge of technology can be a good predictor of adopting cloud computing technologies	74	74	14	14	6	6	6	6	100
I feel I do not possess enough skills required for the development and maintenance of cloud computing technologies.	53	53	17	17	14	14	16	16	100
I feel that cloud computing is beyond the financial reach of most libraries, hence no need to implement it.	61	61	13	13	17	17	9	9	100
I feel the use of cloud computing technologies in libraries will make certain services easy.	77	77	1	1	12	12	10	10	100

Table 8 shows some of the Impact of self-efficacy on librarians' use of cloud computing technologies, they are: the use of cloud computing technologies in libraries will make certain services easy (77%), that librarians knowledge of technology can be a good predictor of adopting cloud computing technologies (74%), that librarians with digital reference experience may have positive attitude towards the implementation of cloud computing technology (65%), That the perceived ease of use of the cloud computing technology will enable me to adopt it. (64%), cloud computing enable storage and preservation of information materials (63%), despite above, the table shows that; cloud computing is beyond the financial reach of most libraries, (61%) and most librarians do not possess enough skills required for the development and maintenance of cloud computing technologies (53%). This implies that there is a positive impact of self-efficacy on librarians' use of cloud computing technologies.

**Research Question Four:** What are the problems facing the use of cloud technologies for building collaborative libraries in Nigeria?

Data in Table 4.9 provide answers to this question

**Table 9: Problems facing the use of cloud technologies for building collaborative libraries in Nigeria**

Cloud Technologies	Agree		Disagree	
	No.	%	No.	%
financial constraints	76	76	24	24
inadequate infrastructure like power	82	82	18	18
Library staff resistance to change	65	65	35	35
negative perception from librarians	69	69	31	31
inadequate skills and competencies	75	75	25	25
security and intrusion issues	73	73	27	27
lack of exposure to international standards	82	82	18	18
requires large amounts of data to function effectively	80	80	20	20
can malfunction just like some other computer programs	79	79	21	21
May increase unemployment	67	67	33	33

Table 9 shows that inadequate infrastructure (82%), lack of exposure to international standards (82%), requires large amounts of data to function effectively (82%), can malfunction just like some other computer programs (79%), financial constraints (76%), inadequate skills and competencies (75%) security and intrusion issues (73%), negative perception from librarians (69%), May increase unemployment (67%) and Library staff resistance to change(65%) are the problems facing the use of cloud technologies for building collaborative libraries in Nigeria. This implies that inadequate infrastructure, lack of exposure to international standards, requires large amounts of data to function effectively, can malfunction just like some other computer programs, financial constraints, inadequate skills and competencies, security and intrusion issues, negative perception from librarians, increase unemployment and library staff resistance to change are the problems facing the use of cloud technologies for building collaborative libraries in Nigeria.

### **Discussion of Findings**

This section discusses the findings of the study. The findings are discussed drawing inferences from author's views in the literature review and relating them to the researcher's point of view based on the result of the study. The

discussion is presented under four (4) subheadings following the purpose of the study.

### **Different Cloud Technologies used by Librarians to Build Collaborative Libraries**

The study revealed that Amazon, Google Drive, Apple i-Cloud, I Drop-Box , Slack, Web-OPAC, Adobe Creative Cloud and Flickr are cloud technologies used by librarians to build collaborative libraries. This finding is in agreement with Mahalakshmi and Ally (2012), Abidi (2012) and Alemayehu (2010) that cloud technologies used by librarians to build collaborative libraries include: Amazon, Google Drive, Apple i-Cloud, I Drop-Box, Slack, Web-OPAC, Adobe Creative Cloud and Flickr.

### **The Level of use of the Cloud Technologies for Building Collaborative Libraries in Nigeria**

The finding from the study revealed that the following Cloud technologies are in use in a very high extent: Amazon, Google Drive and Apple i-Cloud, Web-OPAC, Drop-Box, Adobe Creative, Slack, and Flickr. This finding corroborates the findings of Bik and Goldstein (2013) and Reid (2007) noted that the broad

network access is a major benefit libraries derive from using cloud computing technologies.

### **Influence of Self-efficacy on Librarians' Use of Cloud Technologies for Building Collaborative Libraries**

The study revealed implies that there is positive impact of self-efficacy on librarians' use of cloud computing technologies. This is in conformity with Spacey (2013), who says that; positive attitudes are fundamental in implementing new technologies. Similarly, Bamgboye (2013) found a correlation between attitude toward technology and its implementation and use among librarians.

### **Problems facing the use of Cloud Technologies for Building Collaborative Libraries in Nigeria**

The study revealed implies that inadequate infrastructure, lack of exposure to international standards, requires large amounts of data to function effectively, can malfunction just like some other computer programs, financial constraints, inadequate skills and competencies, security and intrusion issues, negative perception from librarians, increase unemployment and Library staff resistance to change are the problems facing the use of cloud technologies for building collaborative libraries in Nigeria.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### Summary of the Study

This study is focused on the self-efficacy as a factor influencing librarians' use of cloud technologies for building collaborative libraries in Nigeria. Professional Librarians from university libraries in Edo and Delta States in Nigeria were used for this study. The specific purpose of the study was to identify the different cloud technologies used by librarians to build collaborative libraries in Nigeria; examining the level of use of the cloud technologies for building collaborative libraries in Nigeria; investigate the influence of self-efficacy on librarians' use of cloud technologies for building collaborative libraries in Nigeria; find out the problems facing the use of cloud technologies for building collaborative libraries in Nigeria. A total of 120 copies of the questionnaires were distributed and 100 (83%) questionnaires were retrieved and found useful. The summary of the research findings are as follows:

1. The technologies used by Librarians to build collaborative libraries in Nigeria.

2. The use of cloud technologies for building collaborative libraries is to a very high extent.
3. There is positive impact of self-efficacy on librarians' use of cloud computing technologies.
4. That inadequate infrastructure, lack of exposure to international standards, requires large amounts of data to function effectively, can malfunction just like some other computer programs, financial constraints, inadequate skills and competencies, security and intrusion issues, negative perception from librarians, increase unemployment and Library staff resistance to change are the problems facing the use of cloud technologies for building collaborative libraries in Nigeria.

## **Conclusion**

Libraries today have discovered the need to migrate from the print or paper form to a digital or web-based environment because of the numerous benefit associated with the used of cloud or web-based technologies. Services such as email, applications, network or server service can be provided without requiring human interaction with each service provider. Cloud computing reduces paperwork,

lowers transaction costs, and minimizes investment in hardware (and the resources to manage it).

## **Recommendations**

In the light of the findings of this study, the following recommendations are made:

1. University management should provide training program, workshops and seminars to improve staff skills on the use of cloud technologies for building collaborative libraries in Nigeria.
2. University management should equip the library with reliable internet connectivity and technology devices enough for both staff and students.
3. The library should ensure that a power plant is installed in the library to ensure steady power supply in the library so that library activities like collaboration can run smoothly.

## **Contributions to Knowledge**

This study has no doubt contributed to the body of existing knowledge in a number of ways:

1. The study has been able to establish that the use of cloud technologies for building collaborative libraries is to a very high extent.
2. The study has been able to ascertain that there is a positive impact of self-efficacy on librarians' use of cloud computing technologies
3. The study has been able to identify various problems facing the use of cloud technologies for building collaborative libraries in Nigeria.

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## APPENDIX I

### QUESTIONNAIRE

Department of Educational Management,  
Faculty of Education,  
University of Benin,  
Benin City.  
16<sup>th</sup> June, 2021.

Dear Respondent,

I am an undergraduate student of library and information science and I am currently conducting a research work on “self-efficacy as a factor influencing librarians’ use of cloud technologies for building collaborative libraries in Nigeria”. I therefore solicit for your support in completing this instrument. Please note that any information supplied by you in this questionnaire shall be treated with utmost confidentiality and professionalism.

Thank you for your anticipated cooperation.

**Gabriel**

Researcher

#### SECTION A: BIODATA

**Instruction:** please tick [] where appropriate

1. Gender: Male [] Female []

2. Age: 20-30years [  ] 31-40years [  ] 41-50years [  ] 51-60years [  ] 61 years and Above [  ]
3. Career Status: Assistant/Graduate librarian [  ] Librarian II [  ] Librarian I [  ] Senior Librarian [  ] Principal Librarian [  ] Deputy University Librarian [  ] University Librarian [  ]
4. Years of Working Experience: 0 - 5 years [  ] 6-10years [  ] 11-15years [  ] 16-20years [  ] 21 years and Above [  ]

**Section B: Cloud Technologies Used by Librarians for Building Collaborative Libraries**

5. What are the different cloud technologies used by librarians to build collaborative libraries in Nigeria?

<b>Cloud Technologies</b>	<b>Agree</b>	<b>Disagree</b>
Google Drive		
Drop-Box		
Slack		
Adobe Creative Cloud		
Apple i-Cloud		
Web-OPAC		
Flicker		
Amazon		
Others.. Specify		

**Section C: Level of Use of the Cloud Technologies for Building Collaborative Libraries**

5. What is the level of use of the cloud technologies for building collaborative libraries in Nigeria?

6.

<b>Level of Use of Cloud Computing Technologies</b>	<b>Very High</b>	<b>High</b>	<b>Low</b>	<b>Very Low</b>
Google Drive				
Drop-Box				
Slack				
Adobe Creative Cloud				
Apple i-Cloud				
Web-OPAC				
Flicker				
Amazon				

**Section D: Influence of Self-Efficacy on Librarians’ Use of Cloud Technologies for Building Collaborative Libraries**

7. What is the influence of self-efficacy on librarians’ use of cloud computing technologies for building collaborative libraries in Nigeria?

<b>Influence of Self-Efficacy on Librarians’ Use of Cloud Computing Technologies</b>	<b>SD</b>	<b>A</b>	<b>D</b>	<b>SD</b>
The perceived ease of use of the cloud computing technology will enable me to adopt it.				
I like to use cloud computing because it will enable storage and preservation of information materials				
I feel that librarians with digital reference experience may have positive attitude towards the implementation of cloud computing technology				
I perceive that librarians knowledge of technology can be a good predictor of adopting cloud computing technologies				
I feel I do not possess enough skills required for the development and maintenance of cloud computing technologies.				

I feel that cloud computing is beyond the financial reach of most libraries, hence no need to implement it.				
I feel the use of cloud computing technologies in libraries will make certain services easy.				

**Section E: Problems Facing the Use of Cloud Technologies for Building Collaborative Libraries in Nigeria**

8. What are the problems facing the use of cloud technologies for building collaborative libraries in Nigeria?

<b>Cloud Technologies</b>	<b>Agree</b>	<b>Disagree</b>
financial constraints		
inadequate infrastructure like power		
Library staff resistance to change		
negative perception from librarians		
inadequate skills and competencies		
security and intrusion issues		
lack of exposure to international standards		
requires large amounts of data to function effectively		
can malfunction just like some other computer programs		
May increase unemployment		