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Cloud Computing Integration: Perceived Scalability and User-Friendliness for Operational Effectiveness in Academic Library Ecosystem

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Abstract - There is still a lot of substantial uncertainty over the cloud computing integration for operational effectiveness in Kwara State academic libraries. Consequently, they have not been completely embraced. This study examined the strategic analysis of cloud computing integration: perceived scalability and user-friendliness for operational effectiveness in kwara state academic library ecosystem. Three academic libraries were drawn from the selected academic libraries in Kwara State in Nigeria. The respondents, who were system librarians and library managers, were issued an open-ended survey to complete in order to collect data. The findings showed that cloud services streamlined workflows, allowing staff to manage resources and services more effectively without requiring extensive technical skills. The following issues have been noted as potential challenges to the adoption of cloud computing for operational effectiveness Kwara State academic libraries: inadequate funding, a lack of expertise, a poor maintenance culture, a poor power supply, poor Internet service, and a small budget for additional technologies that will support the cloud computing deployment. The study's conclusion with recommendations that academic libraries receive sufficient funding. Because of this, academic librarians who want to adopt cloud computing integration must be skilled and quick-witted to get over their fear of the unknown.

Keywords: Cloud Computing, Academic Libraries, Perceived Scalability, User-friendliness, SaaS, PaaS, IaaS.

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I. INTRODUCTION

No doubt, research, teaching, and learning have all changed as a result of emerging technologies. These developments have made it necessary for academic librarians to have user experience in the ever-changing information explosion ecosystem. Academic librarians around the world are experimenting with new technology to meet their demands [1] [2]. Over the years, numerous cutting-edge technologies have been introduced as a result of technological advancements. Among these are Artificial Intelligence, Radio-Frequency Identification (RFID), Augmented Reality, Blockchain Technologies, Big Data, the Internet of Things, Virtual Reality, and Cloud Computing [1]; [2]; [3]. Cloud computing has garnered significant attention among these

technologies in recent years. As such, different sectors particularly academic libraries have utilized the applications of cloud computing to transform their service and operations effectively [4]

Emphatically, higher education institutions always have academic libraries, which are purpose-built and tasked with supplying knowledge-based resources to uphold the institutions' academic standards. [1];[5]. Academic libraries relied on human labor to complete activities before the advent of information and communication technology (ICT) [6], [7]. [8]; [9] [4], [3] [5] Behind the scenes, tasks like collection development, cataloguing and classification, circulation and reference services, current awareness service (CAS), selective dissemination of information (SDI), and other bibliographic and index services were done manually.

At this early stage, it is crucial to note that there are three primary services available for operational effectiveness while adopting cloud computing in academic libraries. According to ([6], [7], [8], [9] [10]which includes Software-as-a-Service abbreviated as (SaaS), examples of such include Gmail. Platform-as-a-Service (PaaS) such as Google App Engine. Infrastructure-as-a-Service abbreviated as (IaaS) that is, the librarian does not have to physically buy these services [4]). It appears that one of the three services are being used by academic libraries. To begin with, academic libraries do build their own private clouds or cloud computing solutions. Second, academic libraries work with other institutions to develop operational effectiveness for cloud computing integration, and governments and other organizations are investing in cloud infrastructure. Thirdly, in order to leverage operational effectiveness from third parties, academic libraries are investing in cloud computing integration. [4], [3].

The literature makes clear that academic libraries in affluent nations are already reaping the benefits of incorporating cloud computing into their operations and service delivery. However, many academic libraries in Nigeria are still getting their bearings. [11], [12], [13] [6], [14]. Could it be inability to receive training in new technology and professional growth is causing librarians to struggle to adapt to the evolving requirements of their users? Could it be the conventional perspective on librarianship is preventing professionals from fully utilizing the benefits that come with integrating cloud computing. Or are inadequate facilities and a lack of Internet access impeding the use of cloud computing in Nigeria's Kwara State institutions? Or could it be the budgetary limitations making it difficult for Kwara State academic libraries in Nigeria to find pertinent materials and acquire digital content subscriptions?

With these contexts in mind, this study aims to examine the strategic analysis of cloud computing integration: perceived scalability and user-friendliness for operational effectiveness in kwara state academic library ecosystem. Few or no studies in Kwara State, Nigeria or Africa seem to directly address the perceived scalability and user-friendless for operational effectiveness, despite the fact that many articles have been written about the necessity of looking into the subject matter.

A. Objectives of the study

Specifically, the study's objectives were to:

- identify the extent academic libraries considers perceived-scalability when adopting cloud computing integration for operational effectiveness;
- examine the user-friendliness of cloud computing integration for operational effectiveness in academic libraries; and
- identify the challenges faced by academic libraries in the integration of cloud computing for operational effectiveness.

II. LITERATURE REVIEW

1) Cloud computing integration and academic libraries

Academic libraries are changing their offerings by integrating cloud computing and networking, which allows users to access services from any location at any time. [4], [3]. Academic libraries have a lot of intriguing options with cloud computing that could save technology expenses and improve speed and capacity for automation tasks [15], [16]. Academic libraries can therefore benefit greatly from cloud computing integration since it allows them to store more content in the cloud [12], [13], [15]. When a library adopts cloud computing, the storage capacity can be adjusted to accommodate its needs because the service provider manages the storage. This is why many academic libraries are currently struggling to use cloud computing to increase operational effectiveness. Before making the adoption decision, though, a few things will need to be considered. This study highlights perceived scalability and user-friendliness as a couple of the factors that contribute to this.

2) Perceived-scalability of cloud computing integration for operational effectiveness in academic libraries

Academic libraries must be able to readily adapt their processing and storage capacity to meet changing demand, particularly during periods of high usage

[15], [16]. Cloud-based apps are infinitely customizable in terms of apparent scalability. As the library grows and the needs of its patrons alter, academic libraries may easily extend its power, storage, and bandwidth [4], [3]. Academic libraries benefit from cloud services because they offer scalability, which enables accessibility from any location in the world. Users can use a variety of devices, including those at the library, to access data and information. Cloud computing integration's scaling features or constructions can include connectivity, compatibility, and modularity. Academic libraries can deploy software in the public, private, or hybrid cloud to satisfy their security needs, budgets, risk tolerance, and data protection obligations. These options are based on cloud scalability and include SaaS, PaaS, and IaaS. [4], [3].

In a similar context, academic libraries, particularly those that use the private cloud, can also choose to substantially customise the application by choosing from a variety of tools and features to create a solution that suits their needs. Because cloud computing usage is scalable, academic libraries can use storage and software that grows with their real-time requirements without worrying about running out of space, unlike on-premise software. In light of this, research by [15] indicates that the most crucial elements that contribute to the adoption of cloud computing are: affordability, adaptability, compatibility, connectivity, scalability in the use of resources, reduced technological risk, data security, and efficient IT support [3], [4], [16]. Therefore, one of the factors influencing the integration of cloud computing in academic libraries is perceived scalability.

3) User-friendliness of cloud computing adoption for operational effectiveness in academic libraries

Adapted from TAM, the variable indicates how "user-friendly" cloud computing integration is to the user, meaning it is simple to use, comprehend, communicate, and navigate. It plays a crucial role in ensuring that tools and systems are simple to use. Its frequent qualities are straightforward, intuitive, dependable, and effort-free, despite the fact that it is a subjective concept. User-friendliness is typically defined as having qualities that library managers and system librarians find motivating and appealing. As [4], [9] listed a number of operational effectiveness that can be made user-friendly through the adoption of cloud computing in academic libraries. These include: cloud-based access to library collections through the OPAC; delivery of services and documents as a utility; just-in-time during need; on-demand Web-platform library services; user-friendly retrieval strategies, such as biblio commons; Web-based service discovery to make the library's special collections accessible to users who are not cataloged; global cooperation in maintaining bibliographic and authority records; global collaboration on a decision on collection development, preservation, and digitization; Current Awareness Service (CAS); and selective dissemination of information (SDI) services via emails, rich site syndicate RSS feeds, Web feeds, social networking websites, blogs, and others.

In a related vein, [3], [4] shown that reduced investment in physical assets, improved availability, flexibility, mobility, scalability, cost-effectiveness, and operability are all significantly impacted by how easy it is to integrate cloud computing into academic libraries. The results of a study conducted by [15], [16] that looked at the pattern of intuitive cloud computing adoption by reference librarians showed that the librarians are using cloud computing integration for a number of reasons. Therefore, user-friendliness is expected to have an impact on cloud computing integration in order to maximize operational effectiveness in academic libraries. Inadequate infrastructure and security concerns continue to hinder the integration of cloud computing in the US and Africa.

4) Challenges faced by academic libraries in the integration of cloud computing for operational effectiveness

Cloud computing adoption offers substantial perceived-scalability and user-friendliness for academic libraries in terms of enhanced service delivery and user engagement. However, significant challenges must be addressed to facilitate successful adoption. It is observed that challenges are barriers and hurdles, but that they can lead to opportunity if they are overcome. As such, the use of cloud computing, notwithstanding its difficulties, has given academic libraries many chances to take use of web-platform service and operations delivery. Despite the numerous benefits that cloud computing offers academic libraries, associated difficulties are preventing the effective delivery of services. Among the main challenges noted in the literature are a lack of funds, limited resources, inadequate Internet access, bad ICT infrastructure, a lack of managerial support, and frequent hardware failures. [14], [13], [15].

In a similar context, one of the most critical challenges faced by academic libraries in adopting cloud computing is data security. According to [6], [9], concerns about unauthorized access, data breaches, and loss of sensitive information can lead to hesitation in adopting cloud solutions. Libraries must grapple with ensuring compliance with privacy regulations and safeguarding user data, which can create anxiety

about transitioning to cloud-based systems. Integrating cloud computing adoption with existing library systems can also be problematic. As Christopher et al., (2014) conducted a study on the impact and challenges of adoption of cloud computing by public universities in the Southwestern part of Nigeria. A sample size of 100 IT employees, 50 para-IT employees, and 50 students was selected using stratified selection processes and a standardised questionnaire for data collection. Cloud adoption is hampered mostly by worries about privacy, lock-in, data security, and regulatory compliance. In order to address the challenges identified in the research field, strategies were proposed.

It is clear from the review literature that cloud computing is being integrated by academic libraries of all kinds; sadly, Kwara State academic libraries have not followed suit or recognised this trend. The majority of research on the adoption of cloud computing in academic libraries has concentrated mostly on the accessibility, usability, awareness, perception, and attitude of librarians on the adoption. Perceived-scalability and user-friendliness are two of the key factors that determine the adoption of any information system, of which cloud computing adoption is an example. However, very few studies, especially from the context of academic libraries in Kwara State, have examined the adoption of cloud computing from these perspectives. Additionally, the majority of research on the adoption of cloud computing in academic libraries was carried out in industrialised nations. Therefore, this study believes it is crucial to carry out a similar study that focuses on Kwara State's academic libraries and the factors they consider when making the decision to cloud computing integration. Hence, the study examined the strategic analysis of cloud computing integration: perceived scalability and user-friendliness for operational effectiveness in Kwara State academic library ecosystem. It is expected that the study will make data from this area of academic libraries available, raise awareness among other Nigerian academic libraries about the effectiveness of cloud computing and the potential for other libraries to adopt it, and ultimately contribute to the body of knowledge in the field of librarianship.

III. DESIGN AND METHOD

This section explains the methodology used to conduct the study on the adoption of cloud computing in Kwara State's academic libraries. It covers the procedure of administration, data collection, and result presentation, as well as the design, population, sample, and instrument for data collection. The study used only qualitative methods. Qualitative research is well-suited for this inquiry as it allows for an in-depth examination of complex social phenomena, offering rich insights into the pedagogical practices, challenges, and institutional contexts affecting the teaching of Indigenous languages [16] The open-ended survey is the primary means of gathering data for the qualitative approach. In order to better understand the motivations and emotions of the respondents, qualitative approaches typically allow for more in-depth and detailed questioning of the respondents based on their responses. Understanding library manager and system librarians' viewpoints on the adoption of cloud computing in Nigerian libraries in Kwara State and the necessity of investigating the best way to utilize web-platform service and effectiveness operational delivery would aid in the study's conclusion.

The selection of a qualitative approach was made because it is thought to shed light on how librarians in academic libraries view the study's topic, which is the strategic analysis of cloud computing integration: perceived scalability and user-friendliness for operational effectiveness in Kwara State academic library ecosystem. Similarly, the design was selected because the data collected from the respondents allows the researcher to make inferences and the results are typically more descriptive. Furthermore, the qualitative approach is cost-effective, particularly when self-administered. Though many types of qualitative methods are available [16], [17] however, the open-ended survey was embarked upon because it is one of the most common qualitative research methods; and because it is considered the most practicable method during this looming ongoing ASSU strike.

1) Population and sample:

The study's participants were academic librarians in Nigeria's Kwara State. The library at each of these universities was chosen, and one academic library was chosen from each library. Thus, three academic libraries participated in the study in all. The University of Ilorin (Federal), Kwara State University (State), and Landmark University, Omu-Aran (Private) are the three academic libraries that were chosen. The three Kwara State libraries that were chosen for the study were the only ones included. Academic librarians, specifically library managers and system librarians with ICT experience, were the study's target audience. Five librarians were purposefully chosen from each library, for a total of 38 academic librarians who serve as the study's sample.

2) Instrument

Data collection relied primarily on semi-structured interviews, which allowed flexibility and depth in

capturing participants' experiences and perspectives [16]. An open-ended survey was created with performed questions pertaining to the three study objectives. For the respondents to have a clear knowledge of what cloud computing integration is, the poll included instructions on how to answer it as well as an explanation of the idea and its relevance to academic libraries. The open-ended survey's items are those that are pertinent to gathering information on the two variables that are key to the study's objectives.

3) The Procedure of Administration

The researchers intended to follow up with each respondent individually to conduct an interview, but the impending ASSU strike made it impossible for the researcher to do so. Instead, a different arrangement was established with the librarians in charge of each library, which led to the creation of an open-ended survey using an online platform (Google Form) and its distribution to the relevant respondent's contact. The survey was to be completed and returned to the researchers as soon as feasible by the respondents. In view of ethical considerations, the respondents were asked for their informed consent and enthusiastically indicated that they would like to participate in the study. In a similar vein, they were free to stop taking part if they believed it would turn out differently. Twenty-five of the thirty-eight survey copies that were mailed to the respondents were returned completed and suitable for analysis. Table 1 shows the breakdown of the completed survey.

Table 1. Survey Administration and Return Rate

S/N	Chosen Libraries	Ownership	No of Survey Administered	No of Survey Returned	Percentage
1	University of Ilorin Library	Federal	23	20	80
2	Kwara State University Library	State	9	3	12
3	Landmark University Library	Private	6	2	8
Total			38	25	100

Source: Field Survey (2025)

From the table, 38 copies of the open-ended survey that were distributed, 25 copies were returned. This is equivalent to a 65.8% return rate. The researcher organized, compiled, and transcribed the returned open-ended survey copies before reporting the results.

IV. RESULT

The findings from the transcription and analysis of the information gathered via the open-ended survey were described in depth in this section. Therefore, qualitative data obtained through interviews with systems librarians and library managers as well as the content analysis of documents are hereby presented thematically:

1) Perceived scalability of cloud computing integration for operational effectiveness in academic libraries

System librarians and library managers were asked to what extent does your library consider scalability when adopting cloud computing integration? Overall, findings indicate a majority of librarians are flexible/scalable of the technology. A variety of responses were gathered. This was evidenced by the comment of one of the library managers who said:

> *"Honestly, scalability hasn't been a primary driver in our initial cloud adoption. We focused more on cost savings and ease of management. However, we're now realizing its importance as our usage grows, and we're actively researching how to better incorporate scalability into our cloud strategy."*

One systems librarian mentioned,

> *"Scalability is becoming an increasingly important factor. We are starting to document our scalability requirements as part of our cloud adoption process. We are also exploring auto-scaling features offered by our cloud providers."*

In other words, another library manager shared,

> *"We view scalability as an integral part of our disaster recovery strategy. We ensure that our cloud*

infrastructure can quickly scale up in the event of a failure to maintain service availability."

One systems librarian stated,

"We have a mature, data-driven approach to scalability. We use historical usage data and predictive analytics to forecast future demand and automatically adjust our cloud resources using auto-scaling policies. We also regularly review and optimize our scalability strategies to ensure they are aligned with our evolving business needs."

In a related vein, one library manager pointed out,

"We focus on scalability not only for performance but also for cost optimization. We aim to scale down resources during off-peak hours to minimize our cloud spending while ensuring that we can scale up quickly when needed."

Similarly, 20 out of 25 academic librarians (library managers and system librarians) interviewed also confirmed that they have consider scalability when adopting cloud computing solutions in most libraries in the advanced countries of the world. To buttress this, ten librarians (library managers and system librarians) had this kind of response: "*As an academic librarian, we have a dedicated team responsible for managing our cloud infrastructure, and scalability is a key focus of their work. They regularly monitor resource utilization and proactively adjust resources to ensure optimal performance."* The findings reveal that library manager and system librarians have consider scalability when adopting cloud computing solutions in their libraries which include the real-time updates on their databases and collections, ensuring that patrons have access to the latest resources and cloud services has provide access to cutting-edge technologies, like AI driven analytics [4], [3]. According to [18], academic libraries are finding that leveraging cloud storage improves data management and backup capabilities, ensuring that resources are secure and readily available.

2) User-friendliness of cloud computing integration for operational effectiveness in academic libraries

Academic librarians (library managers and system librarians were asked to evaluate the user-friendliness of adopting cloud computing for leveraging operational effectiveness within their libraries. The results reveal that the user-friendliness of academic librarians (library managers and system librarian) and the adoption of cloud computing are somewhat positive. One system librarian reported that:

"The interface of cloud-based library systems is often more intuitive than traditional systems, allowing for a smoother onboarding process for both staff and users." Similarly, "Several respondents emphasised that while cloud computing platforms are user-friendly, adequate training sessions are essential to help staff navigate new systems effectively."

One library manager also submitted that:

"Cloud services streamlined workflows, enabling staff to manage resources and services more efficiently without extensive technical skills." Also, highlighted that cloud computing provides better accessibility for both librarians and patrons, allowing them to access resources and services from anywhere with an Internet connection."

One system librarian also commented:

No doubt, some librarians expressed concerns about the complexity of integrating cloud solutions with legacy systems, which can hinder user-friendliness during the transition. Also indicated that incorporating user feedback into the cloud system's design was crucial for maintaining user-friendliness and meeting user needs effectively."

In other words, another library manager shared,

"Librarians highlighted the cost-effectiveness of cloud computing as a reason for its user-friendliness, as it can reduce the need for extensive IT infrastructure and maintenance. that the reliability of cloud services contributes significantly to the user experience, as downtime can frustrate both staff and users alike."

One systems librarian indicated that,

"The automatic updates provided by cloud services enhance user-friendliness by keeping the system current without requiring manual intervention. emphasized the value of community forums and user groups for cloud computing platforms, which allow users to share tips and troubleshooting

advice, thus enhancing the user experience."

According to the studied literature, a large number of libraries in the US, UK, and Australia have adopted advanced technologies to show that they are prepared to adopt cloud computing in order to leverage web-platform service and operational delivery within their libraries. According to the librarian's perspective, the outcome suggests that integrating cloud computing into library operations and services will increase the library's performance while lowering human mistake rates brought on by repetitive library duties. This finding is consistent with the findings of [15] who demonstrated that cost-effectiveness, improved availability, flexibility, mobility, scalability, increased operability, and decreased investment in physical assets are all significantly impacted by how easy it is for academic libraries to adopt cloud computing.

A) Challenges faced by academic libraries in the integration of cloud computing for operational effectiveness.

System librarians and library managers were requested to enumerate any challenges academic libraries may have encountered when implementing cloud computing to take advantage for operational effectiveness. The results indicate that system librarians and library managers have recognized potential challenges to implementing cloud computing in their libraries. Poor maintenance culture, insufficient experts, poor power supply, poor Internet service and a limited budget to procure other technologies that will help the cloud computing run smoothly are among the challenges identified. Other explanations and the identification of challenges that academic libraries may encounter in the adoption of cloud computing for operational effectiveness are hereby summarised as a follow-up to the aforementioned submissions. One library manager claimed that:

"Adjusting to the new paradigm shift in the adoption of cloud computing for operational effectiveness may pose a challenge for librarians." Why? Because most of the Nigerian libraries I am familiar with are not technologically savvy when it comes to performing their functions. The majority of these librarians rely heavily on the I.T. personnel working in the E-library session to complete some specific ICT tasks."

In other words, one system librarian has this to say,

"challenges with integrating cloud computing solutions into existing legacy systems, which often led to disruptions in service during the transition period. expressed significant concerns about the security of sensitive patron data when using cloud services, leading to hesitance in fully adopting these technologies. Systems librarians noted apprehensions about scalability, as libraries must manage unpredictable increases in user demands without incurring excessive costs." A common challenge noted by interviewees was the need for comprehensive training for staff and patrons, which requires time and resources that are often in short supply."

In consonance with the above response, one system librarian reported that:

"As a result of the cost of procuring and maintaining the technology, only a few academic libraries in Nigeria are ready to integrate cloud computing adoption into their operations and services." The fact is that the number of automated academic libraries is currently limited. In academic libraries that are not fully automated, some of these technologies may not work perfectly. As a result, to keep up with current global practices, academic libraries must consider the installation of sophisticated ICT infrastructure like cloud computing. Except for the University of Lagos Library, Covenant University Library, Landmark University Library, and a few academic libraries in the country, no library in Nigeria is currently using cloud computing to provide services to information users. As a result, I do not see libraries in Nigeria getting there anytime soon."

These results are consistent with [13], [14], [19] report, which describes the challenges academic libraries encounter when integrating cloud computing into library operations and service delivery. These challenges include an unstable power supply, a lack of technological infrastructure, a lack of technical skills, a negative attitude toward advanced automation, the use of inappropriate library software, and technophobia. The findings also corroborate those of [15] who all noted that one of the challenges facing

academic libraries is a shortage of suitable skills and a mismatch in digital competences.

V.CONCLUSION

The study examined the strategic analysis of cloud computing integration: perceived scalability and user-friendliness for operational effectiveness in Kwara State academic library ecosystem. The results show that the use of cloud computing to leverage operational effectiveness in Kwara State academic libraries has consider scalability when adopting cloud computing integration, and the extent of these scalability/flexibility is encouraging. The general perceptions of academic librarians (library managers and system librarians) on the adoption of cloud computing are somewhat positive, with cloud solutions, we have benefited from real-time updates on our databases and collections, ensuring that our patrons have access to the latest resources.

However, it is believed that by moving our catalog to the cloud, we have made it easier for patrons to access our resources anytime and from anywhere, which is crucial for our community. The readiness for the adoption of cloud computing for leveraging operational effectiveness in academic libraries in Nigeria is mixed. No doubt, some academic librarians (library manager and system librarians) expressed concerns about the complexity of integrating cloud solutions with legacy systems, which can hinder user-friendliness during the transition, while some demonstrated a that cloud services streamlined workflows, enabling staff to manage resources and services more efficiently without extensive technical skills. But some respondents cited cloud computing's affordability as a factor in its user-friendliness, pointing out that it can eliminate the need for costly IT equipment and upkeep. Challenges indicated that Kwara State academic libraries in Nigeria may likely face in the adoption of cloud computing for leveraging operational effectiveness are poor maintenance culture, funding, insufficient experts, poor power supply, poor Internet service and a limited budget to procure other technologies that will help the cloud computing run smoothly are all challenges that academic libraries in Kwara State in Nigeria may face when adopting cloud computing in libraries.

A) Recommendations

As a result of the findings of this study, the following are recommended:

- It is suggested that budget allocations for academic libraries should be increased to obtain the necessary infrastructure to improve library service and operational delivery. The majority of academic libraries in Nigeria lack the necessary staff, and therefore require sufficient money, which should come straight from the government or the academic libraries' parent institutions to prevent financial mismanagement. In light of this, academic librarians must be proficient and agile in order to overcome their fear of the unknown when it comes to adopting cloud computing.
- There is a need for academic libraries to invest in high-speed internet infrastructure to ensure stable and continuous access to cloud services. Partnerships with telecommunications providers can enhance internet availability and speed within library premises. Also, develop a clear strategic plan for cloud adoption that outlines goals, objectives, and a timeline. This should align with the library's overall mission and vision while considering user needs and technology trends.
- Create an environment that encourages users to explore and experiment with cloud technologies. Host events such as “Cloud Computing Days” where users can learn about new services and tools. Also, ensure that cloud services comply with accessibility standards (e.g., WCAG) to make them user-friendly for individuals with disabilities, utilizing screen readers and other assistive technologies.
- Invest in upgrading existing network infrastructures to support reliable, high-speed internet connectivity. This might include collaborating with technology providers to improve bandwidth and reduce outages. As a matter of fact, the issue of power and poor internet service, which are both major challenges in Nigerian settings when it comes to technology adoption, should be addressed properly. This can be accomplished by putting in place alternative power generators and relying on a reputable internet service provider. Alternative solutions such as solar power, biofuel for power generation, and the like can also be considered by Kwara State academic libraries in Nigeria.

B) Limitations of the study

This study has limited findings. This is because just three academic libraries in Nigeria's Kwara State provided data for the study. The study is also restricted to Nigeria's Kwara State. The study's design is also insufficiently rigorous to yield findings that may be applied to the library community in Nigeria, Africa, and around the world. This "preliminary study" aims to gather some information that could help guide future research. In this study, only academic libraries were examined. Future research is anticipated to include additional library kinds. Additionally, the study's data was gathered through an open-ended questionnaire. The results cannot therefore be applied to other kinds of libraries. This means that the study

would have been more valuable if it had included other data collection methods, such in-person interviews, observations, or perhaps document analysis.

Contribution to knowledge

There are not many studies in Nigeria that focus on strategic analysis of cloud computing integration: perceived scalability and user-friendliness for operational effectiveness in kwara state academic library ecosystem, especially from a qualitative perspective. As a result, this study advances knowledge by offering comprehensive results that describe the perceived-scalability and user-friendliness of cloud computing for operational effectiveness in Kwara academic in Nigeria. Future related studies may use the data, information on cloud computing usage in academic libraries, and the instrument used to collect the data as references.

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