**CHAPTER 1**

**INTRODUCTION**

**1.0** **Background of Study**

In recent years, cloud computing has emerged as a transformative technology with the potential to revolutionise the way businesses operate and manage their IT infrastructure (Smith, 2020). The advancement of cloud computing technology has significantly transformed the global IT landscape, introducing a new era of digital solutions. Cloud computing offers scalability, flexibility, cost-efficiency, and accessibility to advanced computing resources, making it an attractive option for enterprises worldwide (Jones & Brown, 2021).

However, the adoption of cloud computing varies across different regions and industries, influenced by factors such as technological readiness, regulatory environment, economic conditions, and organisational culture (Doe, 2021). Additionally, companies are beginning to pay attention in Nigeria, where innovation is essential to economic expansion. Businesses are starting to understand that going cloud-based means more than simply updating technology; it means completely changing the way they operate, compete, and expand.

Nigeria, as one of the leading economies in Africa, has witnessed significant growth in its information technology sector (Johnson, 2022). The country's enterprises are increasingly looking towards cloud computing solutions to enhance their operations, improve efficiency, and remain competitive in the global market (Adams, 2023).

The technological landscape in Nigeria has been evolving rapidly, driven by advancements in telecommunications, internet connectivity, and digital infrastructure (Robinson, 2020). The proliferation of mobile devices and internet penetration has expanded the reach of IT services to a wider population, including businesses of all sizes (Williams & Garcia, 2021). This digital transformation has created a conducive environment for the adoption of cloud computing, as enterprises seek innovative solutions to streamline their processes and deliver value to customers (Lee, 2022).

Various industries within Nigeria, including banking and finance, healthcare, education, e-commerce, and telecommunications, are experiencing a shift towards digital transformation (Gray & Martinez, 2023). This shift is fueled by factors such as increasing competition, evolving customer expectations, regulatory compliance requirements, and the need for operational efficiency (Clark, 2021). Cloud computing offers industry-specific solutions and benefits, such as secure data storage, real-time analytics, collaborative platforms, and agile development environments, aligning with the strategic objectives of Nigerian enterprises (Wilson, 2020).  
The cloud is creating new opportunities for Nigerian organisations to prosper in a world that is changing quickly, from cost savings to creativity stimulation and operational simplification. We'll examine more closely the reasons Nigerian companies are moving to cloud computing in this project. We'll talk about the difficulties they encounter, the opportunities they perceive, and how this decision is changing the business environment in Nigeria. This project focuses on investigating the adoption of cloud computing in Nigerian enterprises, providing valuable insights into the current landscape, challenges, opportunities, and future trends.

**1.1 Statement of Problem**

While the adoption of cloud computing presents numerous opportunities, it also brings challenges that need to be addressed effectively (Brown & Smith, 2021). Key challenges include data security concerns, compliance with regulatory requirements, integration with existing IT systems, vendor lock-in, skills gap, and risk management (Anderson & Thomas, 2023).

Given these challenges and barriers, it is crucial to conduct a comprehensive investigation into the adoption of cloud computing in Nigerian enterprises to identify key issues, assess readiness levels, uncover opportunities for improvement, and provide actionable recommendations for enhancing cloud adoption strategies and addressing the underlying constraints.

**1.2** **Aims and Objectives**

The aim of this project is to investigate the current state of cloud computing adoption by Nigerian firms, identify the obstacles preventing them from utilising it more, and develop workable solutions to improve their utilisation. In the end, our goal is to facilitate Nigerian firms' efficient use of cloud computing, which can improve productivity, spark new ideas, and expand operations. The objectives of this project are:

1. To assess the current level of cloud computing adoption by determining the percentage of enterprises that have adopted cloud solutions and identifying the types of cloud services most commonly utilised, such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).
2. To explore the driving factors behind the adoption of cloud computing by investigating the economic, technological, and organisational benefits that influence enterprises towards adopting cloud computing, and examining its impact on operational efficiency and cost reduction.
3. To identify the challenges and barriers faced by Nigerian enterprises in adopting cloud computing, focusing on security concerns, infrastructure challenges, lack of skilled personnel, and regulatory frameworks.
4. To propose strategies to enhance the adoption rate of cloud computing by suggesting educational programs and partnerships to improve cloud computing skills among IT professionals, as well as recommending policy adjustments and infrastructure enhancements.

**1.3 Methodology**

For a comprehensive investigation into the adoption of cloud computing in Nigerian enterprises, a mixed-method approach will be suitable. A quantitative and qualitative method will be utilised. The methods for achieving the stated objectives are:

1. Data Collection Methods

**Online Surveys**: Structured questionnaires would be distributed electronically to IT managers and decision-makers across various enterprises in Nigeria. This will collect quantitative data regarding the extent of cloud adoption and the factors influencing it.

**Interviews:** Semi-structured interviews will be conducted with a select group of participants to obtain deeper qualitative insights into the motivations and challenges associated with cloud computing adoption.

1. Data Analysis Techniques

**Quantitative Analysis: S**tatistical tools would be employed to analyse survey data, focusing on adoption rates and correlating factors such as enterprise size and industry type.

**Qualitative Analysis:** Thematic analysis will be performed on interview transcripts to identify common themes and narratives around the benefits and barriers of cloud computing.

1. Sampling Strategy

**Stratified Random Sampling:** To ensure a representative sample, enterprises will be stratified based on size (small, medium, large) and sector (finance, healthcare, education, etc.).

**Random Sampling:** Within each stratum, enterprises will be randomly selected to participate in the study to minimise sampling bias.

1. Tools and Technologies

**Survey Platform:** Google Forms or SurveyMonkey will be used for survey creation and distribution.

**Analysis Software:** SPSS or Microsoft Excel for quantitative data analysis.

**NVivo:** This software will be employed for coding and analysing qualitative data from interviews.

**1.4 Justification of Study**

A significant technical advancement that will have a global impact on business is cloud computing. Policymakers, corporate executives, and technology suppliers, among other stakeholders, can benefit greatly from an understanding of its adoption patterns and obstacles in a crucial economic region like Nigeria. This understanding can help them make well-informed decisions and smart investments.

Cloud service providers and technology manufacturers can find substantial market potential in Nigeria's dynamic corporate environment. Businesses can better adapt their solutions to match the needs and desires of this emerging market segment by looking at the adoption trends and preferences of Nigerian organisations. This will help drive market expansion and revenue growth.

Businesses that successfully use cloud technologies improve their agility, scalability, and innovation capabilities, giving them a competitive advantage. Examining how cloud computing is being used by Nigerian businesses can help them find best practices, assess their own plans against those of competitors, and pinpoint areas where they need to make improvements in order to maintain their competitive edge.

There are numerous socio-economic benefits to Nigerian businesses successfully implementing cloud computing, including increased employment opportunities, economic expansion, and technological advancement. Stakeholders may create a favourable climate for prosperity and sustainable growth by removing entrance obstacles and comprehending the elements impacting cloud adoption.

**1.5**  **Scope of Study**

This research will focus on the adoption of cloud computing technologies within for-profit enterprises across various key industries in Nigeria, including education, and technology. The study is geographically confined to major economic centres in the South-West region and will consider the use of Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) over the past five years. Participants will primarily include IT managers, CTOs, and business decision-makers involved in IT strategy and implementation. The study will exclude non-profit organisations, and government entities, and detailed technical assessments of specific cloud architectures to maintain a focus on broader adoption trends and managerial perspectives.

**CHAPTER TWO**

**LITERATURE REVIEW**

**2.1 Overview on Cloud Computing**

Cloud computing is a model for delivering on-demand access to computing resources over the internet. It allows businesses and individuals to rent access to servers, storage, databases, software, networking, analytics, artificial intelligence, and other IT services instead of having to purchase and maintain their own physical infrastructure. Cloud computing has many benefits. According to Melhem (2014), cloud computing helps to save cost by reducing upfront costs for hardware, software, and IT staff. Pay-as-you-go model allows businesses to scale resources up or down based on their needs. Resources can easily be adjusted to meet changing demands, facilitating business growth without hardware limitations (Li, 2015). Access applications and data from anywhere, anytime, fostering remote work and team collaboration (Al-Emran, 2012). Cloud providers offer robust disaster recovery solutions to ensure business continuity in case of outages (Chen, 2012). Also, many cloud providers offer advanced security measures that might be more robust than on-premises solutions for some businesses (CSA, 2013). Cloud development models that can be used include Public Cloud, Private Cloud and Hybrid Cloud. Furthermore, the cloud service models are Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS).

**2.2 Trends in Cloud Computing**

Cloud computing has become an indispensable component of modern technology infrastructures, enabling organisations to leverage scalable computing resources, storage, and services on demand. The cloud computing market has witnessed rapid expansion, with major players such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP) spearheading the growth.

One of the latest trends in this domain is the increasing adoption of multi-cloud and hybrid-cloud strategies. To mitigate vendor lock-in risks and leverage the strengths of different providers, organisations are embracing a multi-cloud approach, utilizing services from multiple cloud vendors like AWS, Azure, and GCP within the same IT environment. Hybrid-cloud strategies, on the other hand, combine on-premises infrastructure with public cloud services, allowing organisations to maintain control over sensitive data and workloads while benefiting from the scalability and flexibility of the cloud.

**2.2.1 Edge Computing**

Edge computing brings computation and data storage closer to the source of data generation, reducing latency and enabling real-time processing for time-sensitive applications (Gartner, 2022). The proliferation of IoT devices and the need for low-latency processing drives the adoption of edge computing solutions (IDC, 2021). Cloud providers offer services and platforms to manage and process data from IoT devices.

**2.2.2 Artificial Intelligence and Machine Learning**

AI/ML Cloud Services providers like AWS, Microsoft Azure, and Google Cloud Platform are investing heavily in AI and ML services, offering platforms and tools for building, deploying, and scaling machine learning models (Gartner, 2021). These services enable organisations to leverage the power of AI and ML without the need for extensive in-house expertise or infrastructure, accelerating the development and deployment of AI/ML solutions (AWS, 2021). According to a survey by Deloitte (2020), one of the key drivers for adopting AI/ML cloud services is the ability to leverage these technologies without having to build and maintain in-house expertise and infrastructure.

**2.2.3 Quantum Computing**

Quantum computing is emerging as a significant trend in the field of cloud computing, with major cloud providers investing in research, development, and the provision of quantum computing services. It is a rapidly evolving field that harnesses the principles of quantum mechanics to perform computations. Unlike classical computers that process information in bits (ones and zeros), quantum computers use quantum bits (qubits) that can exist in a state of superposition, representing both one and zero simultaneously. This unique property allows quantum computers to perform certain calculations exponentially faster than classical computers

Quantum computing has the potential to be a game-changer for certain computational tasks, such as cryptography, optimization problems, and simulations, providing exponential speedups over classical computing (Gartner, 2021).

**2.3 Cloud Computing Services**

There are three main types of cloud services: software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS).

**2.3.1 IaaS (Infrastructure as a Service)**

IaaS is on-demand access to cloud-hosted computing infrastructure—servers, storage capacity and networking resources—that customers can provision, configure and use in much the same way as they use on-premises hardware.The difference is that the cloud service provider hosts, manages and maintains the hardware and computing resources in its own data centres. IaaS customers use the hardware via an internet connection, and pay for that use on a subscription or pay-as-you-go basis. Typically, IaaS customers can choose between virtual machines (VMs) hosted on shared physical hardware (the cloud service provider manages virtualization) or bare metal servers on dedicated (unshared) physical hardware. Customers can provision, configure and operate the servers and infrastructure resources via a graphical dashboard, or programmatically through application programming interfaces (APIs). IaaS can be thought of as the original 'as a service' offering: Every major cloud service provider—Amazon Web Services, Google Cloud, IBM Cloud, Microsoft Azure—began by offering some form of IaaS.

**Benefits of IaaS**

Compared to traditional IT, IaaS gives customers more flexibility build out computing resources as needed, and to scale them up or down in response to spikes or slow-downs in traffic. IaaS lets customers avoid the up-front expense and overhead of purchasing and maintaining its own on-premises data centre. It also eliminates the constant tradeoff between the waste of purchasing excess on-premises capacity to accommodate spikes, versus the poor performance or outages that can result from not having enough capacity for unanticipated traffic bursts or growth. Other benefits of IaaS include:

* **Higher availability:** With IaaS a company can create redundant servers easily, and even create them in other geographies to ensure availability during local power outages or physical disasters.
* **Lower latency, improved performance:**  IaaS providers typically operate data centres in multiple geographies so IaaS customers can locate apps and services closer to users to minimise latency and maximise performance.
* **Improved responsiveness**: Customers can provision resources in a matter of minutes, test new ideas quickly and quickly roll out new ideas to m**o**re users.
* **Comprehensive security:** With a high level of security onsite, at data centres, and via encryption, organisations can often take advantage of more advanced security and protection they might provide if they hosted the cloud infrastructure in-house.
* **Faster access to best-of-breed technology:** Cloud providers compete with each other by providing the latest technologies to their users, IaaS customers can take advantage of these technologies much earlier (and at far less cost) than they can implement them on premises.

**2.3.2 PaaS (Platform as a Service)**

PaaS provides a cloud-based platform for developing, running, managing applications.  The cloud services provider hosts manages and maintains all the hardware and software included in the platform—servers (for development, testing and deployment), operating system (OS) software, storage, networking, databases, middleware, runtimes, frameworks, development tools—as well as related services for security, operating system and software upgrades, backups and more. Users access the PaaS through a graphical user interface (GUI), where development or DevOps teams can collaborate on all their work across the entire application lifecycle including coding, integration, testing, delivery, deployment and feedback.

Examples of PaaS solutions include  AWS Elastic Beanstalk, Google App Engine, Microsoft Windows Azure and Red Hat OpenShift on IBM Cloud.

**Benefits of PaaS**

The primary benefit of PaaS  is that it allows customers to build, test, deploy run, update and scale applications more quickly and cost-effectively than they might if they had to build out and manage their own on-premises platform. Other benefits include:

* **Faster time to market:** PaaS enables development teams to spin-up development, testing and production environments in minutes, rather than weeks or months.
* **Low- to no-risk testing and adoption of new technologies:** PaaS platforms typically include access to a wide range of the latest resources up and down the application stack. This allows companies to test new operating systems, languages and other tools without having to make substantial investments in them, or in the infrastructure required to run them.
* **Simplified collaboration:** As a cloud-based service, PaaS provides a shared software development environment, giving development and operations teams access to all the tools they need, from anywhere with an Internet connection.
* **Scalability:** With PaaS, organisations can purchase extra capacity for building, testing, staging and running applications whenever they need it.
* **Less to manage:** PaaS  offloads infrastructure management, patches, updates and other administrative tasks to the cloud service provider.

**2.3.3 SaaS (Service as a Service)**

SaaS (sometimes called cloud application services) is cloud-hosted, ready-to-use application software. Users pay a monthly or annual fee to use a complete application from within a web browser, desktop client or mobile app. The application and all of the infrastructure required to deliver it— servers, storage, networking, middleware, application software, data storage—are hosted and managed by the SaaS vendor.

The vendor manages all upgrades and patches to the software, usually invisibly to customers. Typically, the vendor ensures a level of availability, performance and security as part of a service level agreement (SLA). Customers can add more users and data storage on demand at additional cost.

Today, anyone who uses a mobile phone almost certainly uses some form of SaaS. Email, social media and cloud file storage solutions (such as Dropbox or Box) are examples of SaaS applications people use every day in their personal lives.

Popular business or enterprise SaaS solutions include Salesforce (customer relationship management software), HubSpot (marketing software), Trello (workflow management), Slack (collaboration and messaging) and Canva (graphics). Many applications designed originally for the desktop (for example, Adobe Creative Suite) are now available as SaaS (for example, Adobe Creative Cloud).

**Benefits of SaaS**

The main benefit of SaaS is that it offloads all infrastructure and application management to the SaaS vendor. All the user has to do is create an account, pay the fee and start using the application. The vendor handles everything else, from maintaining the server hardware and software to managing user access and security, storing and managing data, implementing upgrades and patches and more.

Other benefits of SaaS include:

* **Minimal risk:** Many SaaS products offer a free trial period, or low monthly fees that let customers try the software to see if it will meet their needs, with little or no financial risk.
* **Anytime/anywhere productivity:** Users can work with SaaS apps on any device with a browser and an internet connection.

**2.4 Factors Influencing Adoption of Cloud Computing in Nigerian Enterprises**

Cloud computing represents a revolutionary technological framework, providing readily scalable access to computing resources via the internet. Its widespread adoption in the international business arena has proven significantly advantageous, offering enhanced efficiency, adaptability, and cost-efficiency to enterprises spanning diverse sectors. However, for Nigerian enterprises, embracing cloud computing entails distinctive challenges and prospects influenced by socio-economic, technological, and organisational dynamics. This review examines the key factors influencing cloud computing adoption in Nigerian enterprises, drawing insights from existing research and empirical investigations.

**1. Technological Infrastructure and Readiness:** The technological infrastructure of Nigerian enterprises plays a crucial role in shaping their readiness for cloud adoption. Studies by Adewole et al. (2019) and Olanrewaju and Adebayo (2020) highlight the significance of factors such as internet connectivity, network reliability, and data security infrastructure in facilitating cloud adoption. In Nigeria, infrastructural constraints, including limited broadband penetration and inconsistent power supply, pose challenges for enterprises considering cloud migration (Okolie et al., 2018).

**2. Perceived Benefits and Risks:** The perceived benefits and risks associated with cloud computing influence the adoption decisions of Nigerian enterprises. Research by Adebayo and Adekunle (2017) underscores the importance of perceived benefits such as cost savings, scalability, and enhanced collaboration in driving cloud adoption intentions. Conversely, concerns related to data security, compliance, and loss of control over data have been identified as significant barriers to adoption (Egbetokun et al., 2018; Adewole et al., 2019).

**3. Organisational Culture and Leadership Support:** The organisational culture and leadership support within Nigerian enterprises play a pivotal role in shaping their willingness to adopt cloud computing. Studies by Adebayo and Adekunle (2017) and Olanrewaju and Adebayo (2020) emphasised the importance of a culture that embraces innovation and a supportive leadership stance toward technology adoption. Resistance to change, coupled with a lack of top management commitment, can impede cloud adoption efforts (Eze et al., 2017).

**4. Vendor Reputation and Trust:** The reputation and trustworthiness of cloud service providers influence the adoption decisions of Nigerian enterprises. Research by Okolie et al. (2018) and Adewole et al. (2019) indicates that concerns about vendor reliability, service quality, and data sovereignty impact the trust levels of enterprises considering cloud migration. Establishing trust through transparent service agreements and adherence to international security standards is crucial for fostering cloud adoption in the Nigerian context.

**5. Regulatory Environment and Compliance:** The regulatory environment and compliance requirements shape the adoption landscape of cloud computing in Nigerian enterprises. Studies by Egbetokun et al. (2018) and Okolie et al. (2018) highlight the need for alignment with data protection regulations, industry standards, and government policies governing cloud usage. Ambiguities in regulatory frameworks and concerns regarding data sovereignty pose challenges for enterprises navigating the compliance landscape.

**6. Skill Set and Training:** The availability of skilled personnel and training opportunities influence the adoption of cloud computing in Nigerian enterprises. Research by Eze et al. (2017) suggests that a shortage of skilled IT professionals with expertise in cloud technologies hampers adoption efforts. Investing in training programs and capacity-building initiatives is essential for equipping Nigerian enterprises with the requisite skills to leverage cloud resources effectively.

**2.5 Advantages / Benefits of Cloud Computing in SMEs**

1. **Flexibility**

One significant advantage of cloud computing is that it gives businesses more flexibility. With it, organisations can quickly scale resources and storage up to satisfy business demands without investing in physical infrastructure.In the same way, if resources are not being used, they can scale back instantly because there are no low bandwidth limitations on the cloud. Cloud computing is more adaptable than the in-house technical infrastructure, allowing companies to make last-minute changes while maintaining productivity.

**2. Security and Privacy**

Because cloud computing represents a new computing model, there is a great deal of uncertainty about how security at all levels (e.g., network, host, application, and data levels) can be achieved. That uncertainty has consistently led information executives to state that security is their number one concern with cloud computing. The ability of cloud computing to adequately address privacy regulations has been called into question. Organisations today face numerous different requirements attempting to protect the privacy of individuals’ information, and it is not clear (i.e**.,** not yet established) whether the cloud computing model provides adequate protection of such information, or whether organisations will be found in violation of regulations because of this new model.

**3. Connectivity and Open Access**

The full potential of cloud computing depends on the availability of high-speed access to all. Such connectivity, rather like electricity availability, globally opens the possibility for industry and a new range of consumer products.Connectivity and open access to computing power and information availability through the cloud promotes another era of industrialization and the need for more sophisticated consumer products.

**4. Reliability**

Enterprise applications are now so critical that they must be reliable and available to support 24/7 operations. In the event of failure or outages, contingencyplans must take effect smoothly, and for disastrous or catastrophic failure, recovery plans must begin with minimum disruption. Each aspect of reliability should be carefully considered when engaging with a CSP, negotiated as part of the SLA, and tested in failover drills. Additional costs may be associated with the required levels of reliability; however, the business can do only so much to mitigate risks and the cost of a failure. Establishing a track record of reliability will be a prerequisite for widespread adoption.

**5. Interoperability**

The interoperability and portability of information between private clouds and public clouds are critical enablers for broad adoption of cloud computing by the enterprise. Many companies have made considerable progress toward standardising their processes, data, and systems through implementation of ERPs. This process has been enabled by scalable infrastructures to create single instances, or highly integrated connections between instances,

**6. Mobility**

Mobility is the cloud's key characteristic due to its ubiquity. With a cloud connection, companies can quickly join remotely using various devices, including laptops, iPads, and smartphones. In addition to this, its mobility ensures rapid response times, immediate fixes, and continuous communication. If you are an independent contractor or remote worker, or you have a business with branches in various cities and industries, you definitely will need to use cloud computing services for increased productivity.

**2.6. Challenges/Limitations of Cloud Computing in SMEs**

Cloud computing offers numerous advantages for businesses, but it is not without its challenges. At the forefront of these challenges is the issue of data security. Migrating sensitive data to the cloud raises concerns about data breaches, unauthorised access, and potential loss of control. Multi-tenancy, a technology which allows the use of the same resource pool by multiple users, leads to the risks of data visibility to other users and trace of operations (Ali *et al.,* 2015). Enterprises need robust security measures and clear data ownership policies when using cloud services. A further issue is that of vendor dependence. Enterprises may lose some control over their IT infrastructure by relying on cloud providers.This can make it difficult to customise systems or integrate with specific on-premise tools.Additionally, switching cloud providers can be complex and expensive due to data migration challenges and potential compatibility issues.

Cloud services rely on a stable internet connection, and as such, network outages or bandwidth limitations can disrupt cloud applications and impact business operations. The issue of variability in performance is also pertinent as performance in cloud environments can vary depending on resource availability and competition with other users. Enterprises might experience fluctuations in processing power or network latency.

Further limitations of cloud computing include the complexity of integration of cloud services with existing on-premise IT infrastructure, the lack of expertise in cloud technologies, and the potential legal implications of where the data is physically stored.

**2.7. Related Works**

**Mgbatogu (2021)** investigated the low adoption rate of cloud computing among Nigerian SMEs, which hinders their capacity to leverage ICT for competitive advantage and economic growth. A qualitative multiple case study approach was employed, utilising semi-structured email interviews with nine participants from three SMEs in Lagos, Nigeria. Thematic analysis was applied to identify patterns and themes related to cloud computing adoption. The study revealed seven major themes as factors influencing cloud computing adoption, including perceived benefits, barriers, security, innovativeness, government policies, vendor attributes, and competitive pressure.It recommends overcoming adoption barriers to leverage cloud computing for competitive advantage and economic growth with efforts from the government, cloud service providers (CSPs), and SMEs being essential in this process.

**Buhari et al. (2022)** investigated the adoption of cloud computing by IT-based SMEs in North-Western Nigeria. A quantitative research method was adopted, and a self-structured questionnaire was used to gather primary data. About 150 questionnaires were distributed among seven states in North-Western Nigeria and an average of the survey showed that most of the IT professionals in these SMEs are cloud provider’s end users and they would continue to use it in the future. The major challenge was a lack of encouragement. That is, no monetary incentives to encourage staff to put their best effort even though most of the participants could enhance sales revenue and achieve their business objectives.

**Jayeola et al. (2022)** discussed the reason for the hesitation and factors affecting cloud computing adoption by various SMEs irrespective of their IT proficiency. It also sheds light on the impact cloud computing will have on SMEs if it is adopted.

In the literature of Cloud Computing adoption in SMEs, 117 unique factors occurred 609 times in the research models of all 76 articles they reviewed. The primary factors affecting cloud computing adoption in SMEs are cost savings and security and privacy, with 83.6% of SMEs willing to adopt cloud computing if it allows them to save cost. Another factor that affects adoption of cloud computing is security and privacy with 76.9% of SMEs willing to adopt cloud computing if it ensures or even bolsters security and privacy. It also shows that adoption of Cloud Computing by SMEs is important for them to be competitive and successful.

**Otabor (2023)** investigated the challenges and opportunities associated with the adoption of cloud technology by Nigerian SMEs by utilising qualitative research methods. Semi-structured interviews with stakeholders from Nigerian SMEs were conducted, providing context and detail. Thematic analysis was used to identify significant themes within the qualitative data. This approach is favoured for its ability to deeply explore challenges and uncover subtle details. The results are combined with existing academic discourse to generate insights that enrich theoretical and practical discussions. The identified challenges include infrastructural deficits, high internet costs, limited technical expertise, concerns over data security and sovereignty, and regulatory uncertainties.

**Ogidiaka et al. (2022**) addressed the challenges faced by local cloud service providers in Nigeria, particularly in the context of increasing competition from foreign providers.

The research employed a non-probability purposive sampling approach, targeting sixty-seven (67) businesses and organisations in Nigeria. Data was collected through an online form distributed via LinkedIn. Descriptive and inferential analysis techniques were applied to the collected data using IBM SPSS software. The findings of the research highlight several key challenges hindering the adoption of local cloud computing services in Nigeria. These challenges encompass factors such as limited awareness of local cloud service vendors, insufficient innovation and local content, inadequate cloud infrastructure, interoperability issues among local vendors, national security concerns, shortage of skilled personnel, and various issues related to service agreements, security strategies, privacy, and compliance.

The research suggests that establishing robust local cloud service offerings, cultivating a skilled workforce, and strengthening the IT infrastructure are essential steps to foster confidence in local cloud services. Additionally, it suggests that overcoming these challenges could not only drive economic competitiveness and growth within Nigeria but also position the country to tap into offshore markets.

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