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Cloud Computing Practices among Small and Medium-Sized Enterprises (SMEs); Contemporary Trends, Possibilities, and Challenges

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Abstract:- The study focused on Cloud Computing practices among Small and Medium-Sized Enterprises (SMEs), the Contemporary trends, Possibilities, and Challenges. The objectives were to review the history behind cloud computing in relation to SMEs in Ghana, to examine factors that impact the adoption of cloud computing by SMEs in Ghana that tend to affect their performance, to analyze the impact of cloud computing migration strategy on cloud computing adoption, to evaluate the merits and demerits of cloud computing adoption, and to analyze the security involved in using cloud computing. The study employed a descriptive research design to describe the variables of interest, and information. This study found that cloud computing has a favorable impact on SMEs by reducing their operating costs, thereby increasing their margins. It also revealed that despite the many advantages of cloud computing, demerits such as security and privacy, lack of skills, expertise, and resources, and limited flexibility and control contribute to the low rate of cloud service adoption in Ghana. It is recommended that cloud services must be developed to integrate seamlessly with the existing Information Technology (IT) systems prevalent in the SME industry, and cloud service providers provide adequate migration training for SMEs as part of the adoption process. It also emphasizes the need for future cloud technology research to review new cloud services and practices that SMEs can adopt to gain a competitive advantage in the market.

Keywords:- *Cloud computing, Small and Medium-sized Enterprises (SMEs), Digital transformation, Technology adoption.*

I. INTRODUCTION

➢ *Background of Study*

Business and information technology are becoming more intertwined. I don't think anyone can fully discuss one without talking about the other, Gates (2016) remarked. Today, all sizes of firms are aligning cloud computing with business because it aids in the renovation of their technological operations by establishing flexible and adaptable Information Technology (IT) infrastructure to meet changing business needs (Tripathi, et al., 2022). According to (Sanarathna, et al., 2018), the value of cloud computing is impacted by its relative advantages, such as increased earnings, lower costs, and new business opportunities. Therefore, everyone agrees that cloud computing is essential for maintaining competitiveness (Woo-Forrester, 2021).

The most significant technological transition since the invention of the personal computer and the widespread adoption of the internet has been cloud computing (Kavis, 2014). According to Microsoft, cloud computing is "the distribution of computer services, including servers, storage, databases, networking, software, analytics, and intelligence, over the internet ("the cloud") to facilitate scalability, more flexible resources, and faster innovation." Cloud services are typically fee-based, which enables you to optimize resource utilization, reduce expenses, and expand your business.

The undeniable fact is that small and medium-sized enterprises (SMEs) significantly contribute to the economies of nations worldwide. In Ghana, SMEs play a critical part in the development of economic infrastructure to boost overall firm performance with the support of scientific and technological innovation (Ali, et al., 2019). "90% of registered enterprises in Ghana are SMEs," according to the Registrar General Department, as reported by Graphic Online (2014). According to a separate report, SMEs account for over 85% of Ghana's employment and contribute 70% of the country's Gross Domestic Product (GDP). As a result, it is self-evident that SMEs must be helped to develop to maximize Ghana's developmental potential. However, SMEs, for all their importance, run the danger of failing. According to data from the Bureau of Labour Statistics, as reported by Fundera (2021), roughly 20% of small businesses do not survive in their first year of operation. By the end of the 5th year, about 50% will have failed. And only 30% will remain in 10 years. Cloud computing has several advantages and can help businesses in upgrading their operations and utilizing technology more effectively by lowering software and hardware expenses.

➢ *Research Motivation*

About 20 years ago, cloud computing emerged as a solution for companies that relied on traditional methods to supply their IT infrastructure, including the server room (Ahmad, et al., 2020). The server room houses a database server, mail server, networking, firewalls, routers, modems, switches, Query Per Second (QPS), a configurable system, high net speed, and maintenance experts.

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To establish such an IT infrastructure, we would like to spend much more. To overcome these problems and scale back IT infrastructure costs, cloud computing comes into existence. Cloud computing is the most evolving concept, which has optimized the IT performance of the SME sector without huge costs on infrastructure (Khan, et al., 2015). Cloud computing operates on an identical principle to web-based email clients, allowing users to access all the features and files of the system without having to store a majority of that system on their computers (Nalajala, et al., 2020). Most individuals utilize cloud computing products without even noticing they are doing so.

Companies offering cloud computing services are expanding the range and quantity of their offerings via prominent public cloud platforms such as Microsoft Azure, Amazon Web Services (AWS), and Google Cloud Platform, which are gaining unprecedented popularity (Vairagkar, 2021). Several social networking platforms, including Facebook, Instagram, Google Chat, and Gmail, are cloud-based. Users transmit their data to a cloud-hosted server, which retains the information for future retrieval. While these programs are beneficial for personal use, they have considerably more value for enterprises prepared to use substantial data over a secure internet network connection.

For example, workers can access customer information via cloud-based customer relationship management software like Salesforce from their smartphone, tablet or while travelling and may quickly share that information with other authorized parties anywhere in the universe. We need cloud computing, as it does us more good than harm.

➢ *Research Objectives*

The main objective of this study is cloud computing practices among SMEs, contemporary trends, possibilities, and challenges.

- Review the history behind cloud computing in relation to SMEs in Ghana.
- Examine elements influencing SMEs decision to use cloud computing in Ghana that tend to affect their performance.
- Analyze the impact of the cloud migration strategy on cloud computing adoption.
- Evaluate the merits and demerits of cloud computing with its adoption by some SMEs in Ghana.
- Examine the security issues surrounding cloud computing.

➢ *Research Questions*

The study aims to answer the following questions:

- Why do SMEs in Ghana adopt cloud computing, what are the drivers of its adoption, and how secure it is for SMEs in Ghana?
- What is the current state of cloud computing in operation within some SMEs in Ghana?
- What are the pros and cons of their performance?

➢ *Significance of Study*

Some time ago, we used to spend time on the installation of software, maintenance, backup, and some other IT-related problems. Currently, you can choose not to install some applications on your computer. In cloud computing, more than 1, from 100 to 1000 people can use the same software without installing it. This saves time and increases productivity, as well as well as being an advantage for small-scale business owners.

For instance, we can access Microsoft Office on any device from anywhere in the world without needing to install it. Data can now be stored, accessed, and shared using storage web applications such as Dropbox, Google Drive, and many others. We can also use an online Microsoft Excel to manage an Excel sheet with our colleagues or coworkers.

Previously, data storage and management took longer than development (Sharma, et al., 2017). We now save everything in real-time, eliminating the need to use the Control Plus S (Ctrl+S) keys for document saving. We can now access this with a simple sign-in. Cloud computing automates most tasks, eliminating the need for monitoring or management.

The main motivation behind cloud computing is to make businesses get access to a facility that centralizes an organization's shared IT operations and manages tasks from a remote location.

Cloud computing works on the pay-as-you-go pricing model. It allows individuals to pay only for the services they require and can afford. It also helps businesses lower their operating costs.

➢ *Structure of Thesis*

This essay is organized into three chapters. Chapter one is the introduction to the long essay. The study's background, research objectives, justification, and thesis scope comprise this section. Chapter two presents a comprehensive review of relevant literature related to the study, specifically focusing on the overview of cloud computing, its application in SMEs, current trends in cloud computing, and the opportunities and challenges associated with it. Chapter three discusses the research methodology. The chapter outlines the research methods employed in the study, the data sources used, and the overall research design. Chapter four, the final chapter, presents the summarized discussion of the literature review and conclusion with research implications and recommendations for further studies on cloud computing practices among SMEs.

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II. LITERATURE REVIEW

➢ *Introduction*

This portion of the research presents a comprehensive literature review. It includes an overview of cloud computing, small and medium-sized enterprises (SMEs) and their cloud computing practices, current developments in cloud computing, as well as the opportunities and potential obstacles associated with it.

➢ *Overview of Cloud Computing*

There is no universal definition of what cloud computing entails, as both scholars and industry players are making significant strives to come out with a standard definition of the technology (Ahmed, 2013). Information technologies have long been viewed as a product, but this idea seems to gradually decrease as many IT providers are working hard to provide the best services at an affordable price to customers. Cloud computing is an era where information technologies are delivered as a service (Senyo, et al., 2015). The National Institute of Standards and Technology (NIST) defines cloud computing as a model that facilitates convenient, on-demand network access to a shared pool of configurable computing resources (such as networks, servers, storage, applications, and services) that can be swiftly provisioned and released with minimal management effort or service provider involvement.

Five criteria must either be present or dominate for cloud computing: scalability and elasticity (service scale with and on demand); a well-defined service interface of basis; services are tracked on a usage basis to effect multiple payment models; services must share a pool of resources for economies of scale; and services should be delivered via internet protocols such as Internet Protocol (IP) or Hypertext Transfer Protocol (HTTP) (Gartner, 2008 and Global Access Partners, 2011).

➢ *Models of Cloud Computing*

Software as a Service (SaaS) offers readily available online software solutions. The SaaS provider maintains exclusive control over the application software. Examples of SaaS applications include online email, project management systems, Customer Relationship Management (CRM) systems, and social media platforms. Bois (2010) asserts that Salesforce was one of the pioneering SaaS businesses to provide the cloud infrastructure necessary for developing and managing commercial applications.

The Platform as a Service (PaaS) model provides customers with a pre-constructed application platform, eliminating the need for them to invest time in developing the requisite underlying infrastructure. PaaS autonomously scales on the backend and provides essential infrastructure components according to application requirements. PaaS include, Google App Engine, Microsoft Azure, OpenShift, Amazon Web Services (AWS) Lambda, AWS Elastic Beanstalk, and Systems Applications and Products (SAP) Cloud Platform (Manasa, 2018).

The Infrastructure as a Service (IaaS) model delivers hardware, software, security, and data management to clients. Through IaaS, customers have direct access to foundational software components, including firmware and device drivers, including the operating system on virtual machines or the administration interface of a firewall or load balancer (Miller, 2008). Amazon Web Services is among the major Infrastructure as a Service supplier.

➢ *Types of Cloud Computing*

A public cloud is a multi-tenant system in which the end-user compensates for the use of resources on a shared grid of commodity resources with other customers (Kavis, 2014). A public cloud is governed by a third-party provider operating from one or more data centers. The service is provided to several clients (the cloud is available to various tenants) via a shared infrastructure. The public cloud may exhibit diminished security due to its accessibility and insufficient restrictions. For example, electronic mail.

The private cloud enables access to systems and services only inside an enterprise. Businesses must get them and hence, do not gain from reduced initial capital expenditures and less direct oversight. It provides enhanced security due to its confidential character. Private clouds vary from public clouds in such a way that their network, computing, and storage infrastructure is exclusively allocated to a single enterprise and is not shared with any other entity.

A hybrid cloud results from a company running non-core apps on a public cloud while keeping private data and key applications housed on a private cloud. Service provided by means of cloud component integration is changing; obstacles are being removed and enablers are under development. One of the main worries is believing that the data of a company is private and safe. Developing this confidence marks a turning point in the acceptance of the whole spectrum of cloud computing. (Owopetu 2013)

➢ *Small and Medium-sized Enterprises (SMEs)*

Small and medium-sized companies are autonomous, non-subsidiary companies with less than specified workforce. Legal business theory in Europe defines a company as an SME depending on numerous factors. Among these are that company's workforce count as well as its cash turnover. The legislation defines a microbusiness as one with up to nine workers. While medium-sized companies hire between 50 and 249 people, small organizations usually have 10 to 49 employees.

By means of job creation and money generating, SMEs significantly contribute to the economic growth of a nation. Given about 98% of all enterprises in the US economy are categorized as SMEs (Neumark, et al., 2011), SMEs are the most crucial source of employment generation in this country. Small businesses are seen to be quite important in stimulating entrepreneurial development, contributing to the transformation of the traditional sector into a modern one, creating employment, lowering rural and urban migration, and providing training ground for managerial skill acquisition (Akande, 2013). The introduction of COVID-19 also had a

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significant impact on SMEs, causing them to decrease or discontinue operations.

➢ *SMEs and Cloud Computing Practices in Ghana*

An SMEs in Ghana would be characterized as having yearly revenue ranging from $23,700 to $2,370,000 (Gibson, et al., 2008). The Ghana Statistical Service regards companies with less than ten workers as small-scale businesses and those with more than ten as medium and large-scale businesses (Sarpong, 2012). Some major contributions made by the small and medium-sized company (SME) community in Ghana are employment, regional development, and innovation.

Ghana has experienced favorable growth in Information and Communication Technology (ICT) use since 2000, primarily due to mobile internet penetration (Goodman AMC, 2015). Thanks to the development of personal computers, tablets, and cell phones nowadays, small companies are progressively embracing and using technology. The information age has transformed how businesses operate (Selase, et al., 2019). Businesses now require quick responses to various consumer and customer expectations of businesses operating in Ghana's economy as well as the global one. Businesses of small and medium sizes are ready to meet this challenge. A recent invention that has transformed business, trade, agriculture, industry, and government service methods of operation is the internet. Businesses will adopt it as a means to adapt to global dynamics.

Sadly, SMEs also have somewhat high rates of company collapse due to many related reasons to finance, and these rates are probably going to get worse as a result of the current global economic hardship. To improve survival and growth, the SME sector needs innovative strategies. Such approaches most certainly rely heavily on the effective use of information and communication technology (Jones, 2011). Successful small firms sometimes face major obstacles when they grow into other areas, either by relocating to a new location or expanding their present one. They require an IT infrastructure that can keep up with their expansion as they grow (Matt, 2016).

Different laws and regulations supported by the Ghanaian government help to develop different service levels for cloud data transmission and storage by means of ease of establishment.

This includes, among others, the Information Communication and Technology for Accelerated Development (ICT4AD) policy. Following incremental advances in its ICT sector, Ghana is enhancing its competitiveness and enabling small businesses to benefit from cloud computing. In Ghana, cloud computing is currently the smart way to go.

Cloud computing has emerged as a significant trend and is anticipated to be used to enhance corporate efficiency (Pornwasin, 2013). Cloud technology enables individuals and small enterprises to effortlessly establish enterprise-level services instantaneously. Roy Stephan, 2011. Recent studies have emphasized the capacity of cloud computing to augment the development and profitability of SMEs while fostering entrepreneurial behavior across all tiers. Due to the economical, integrated cloud computing services, small enterprises may circumvent substantial expenditures in hardware and software, facilitating their market entry. Cloud computing can aid universities tremendously because of its storage capacity and economic viability, allowing for more efficient research management procedures in various sectors (business, medical, scientific, etc.).

Consequently, cloud computing serves as an optimal solution for innovation-centric enterprises. Small and medium-sized enterprises may capitalize on possibilities that enable them to compete in an innovative ICT landscape and provide the equitable conditions necessary for commercial success by adopting cloud services. It is a digital transformation endeavor whereby firms might enhance their technological utilization and more effectively synchronize IT with business objectives
(D'sousa, 2017).

➢ *Cloud Computing Adoption among SMEs in Ghana*

Although cloud computing techniques are rapidly expanding inside SMEs, the rate of adoption by these companies has remained rather low in Ghana (Mac-Gregor, et al., 2005), which results in limited market share and hence influences the performance of the market.

According to studies, security, privacy, and trust are the primary negative effects of Ghanaians using cloud services (Avram, 2014). Security is the main obstacle to the effective acceptance and spread of cloud computing solutions for people and businesses. Because users of cloud services have limited control over the infrastructure they are offered, there may be certain security problems and hacker attacks.

The problem of data migration from one service provider to another is another concern. The lack of a clear and functioning legal framework in Ghana makes it difficult to switch between vendors, leading to soft lock-in (David, et al., 2016). Given the high switching costs and lack of compatibility, switching between vendors is typically challenging.

Cloud computing is dependent on constant electricity and a running network (Kumar, 2013). Unfortunately, in Ghana, there is a lack of access to affordable broadband, unstable and slow bandwidths, and frequent power outages.

➢ *Cloud Adoption Best Practices for SMEs*

The majority of cloud computing to date has sought to increase readers' comprehension of and familiarity with cloud computing (Tehrani, et al., 2014). Other academics concentrate on just one kind of cloud computing in order to better grasp the concept. Many more people try to identify the challenges of using cloud computing. Still, migration is not a particularly noisy subject.

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Researchers in this subject simply overlook this point even after everything that has been written about what cloud computing is, and the many advantages it can provide to companies and the possible difficulties a cloud migration plan has. It has the capacity to affect the company's choice to embrace cloud computing. Moving to the cloud is not just a technological challenge but also far from a passing trend. It should be anchored in corporate results and the particular goals the organization aims to reach. (Accenture, 2022).

Cloud migration is a complex, time-consuming, and resource intensive endeavor that is easy to understand but challenging to execute for small and medium-sized organizations. To properly comprehend the expectations and advantages of cloud computing, SMEs must design a migration strategy.

➢ *Understanding the Needs*

Companies have to first know why they need cloud computing. They should also go ready with a list of the expected advantages of embracing clouds. For instance, certain strategic goals to reach using cloud technology are:

- Improving IT system efficiency and resiliency
- Experimenting and completing new tasks faster
- Establishing agile, leaner operations

Although the cloud can offer many advantages to companies, it does not ensure that it will satisfy your needs. At times, implementing the cloud may need changes all around your company depending on the business needs, such as storing data on the public cloud, simplifying procedures, developing apps, and so on.

➢ *Think Security*

Many times, companies deal with private data. Furthermore, data breaches have become very regular as digital transformation has evolved. Therefore, cloud service providers add significant security elements into their systems. Still, it makes sense to have extra levels of security in place every time a company goes to the cloud.

The best plan of action is to assess your cloud security. Furthermore, it is very important is include your security team right from the beginning of the cloud migration process. Should this prove impracticable, SMEs might engage with cloud security service providers to provide complete cloud security. By guaranteeing crucial data protection, this stage guarantees ongoing expansion of SMEs.

➢ *Make the Most of the Professionals*

Selecting the appropriate partners is essential to guarantee that your cloud migration initiatives are meticulously planned, prioritized, performed, and advanced. Cloud adoption or migration may pose challenges for small and medium-sized enterprises, necessitating the assistance of on-site cloud specialists.

Partnering with the suitable collaborator might significantly alter their circumstances. Consequently, SMEs have to optimize their use of their selected cloud service provider. They must use their expertise at every stage of the cloud migration process to ensure a seamless delivery and to address any potential difficulties that may occur.

➢ *Trends in Cloud Computing*

Virtualization is the facilitator of cloud computing but also leads to new issues. In particular, the ease of provisioning and running virtual servers as needed without worrying about facilities or networks often yields server sprawl, as all the virtual machines and reproduced application components still need to be controlled. Along with the present encouraging of equipment virtualization, service-oriented design, as well as free and energy computers, today's timetable of high-capacity networks, reasonably priced computer systems, and storage space devices have resulted in improvement in cloud computing. Development costs exceeding 50% annually are seen by cloud providers (Gadde, et al., 2018).

➢ *Mobile Cloud Computing*

Mobile cloud computing integrates cloud computing with mobile networks to provide advantages to mobile users, network specialists, and cloud service providers. The fundamental concept of mobile cloud computing is to facilitate the deployment of many mobile apps on smartphones while enhancing the user experience (Alanger, 2013).

Cloud computing has extended the outsourcing of computational resources including IT frameworks, service systems, and software applications in the current times. Ultrafast fourth-generation wireless (4G) mobile networks, high featured smart gadgets, and tablet computers help to satisfy the requirements thus enabling cloud computing to enter the mobile space. Apart from others, future uses of mobile cloud computing will have a major influence on all social and organizational activities.

Among the sectors with the fastest increasing demand for cloud and mobile solutions are mobile advertising, social media, smart cities, healthcare, and organizational processes. Cloud technologies and mobile working options will help companies to bring fresh ideas. These trends may help magnates reach customers, increase efficiency and performance, and find strategies to improve competitiveness.

➢ *The Rise of Cloud Containers*

According to a report by Portworx, et al. (2019), most companies surveyed are either using containers or considering using them. Because of this container, ultramodern technology remains a highly reliable system for rotating applications back and forth. Mark Wheatley believes that running many programs on one host may be done using containers. Though unlike virtualizing a web server to generate various Operating System (OS), containers employ an even more lightweight option by essentially virtualizing the OS, allowing many workers to operate on a single host. Containers simplify the deployment and also the management of cloud technologies. Among the well-known companies in container innovation are Docker and ZeroVM (Zero Virtual Machine), which Rackspace acquired.

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- *Identity Management and Protection from a Security Perspective*

In cloud computing, security has always been much sought after. This concern is more important than ever as ever more services move considerably more data and information directly onto cloud web servers. Fostering cloud computing for services as well as government companies still face security as the main obstacle. From a security standpoint, public cloud services are seen as one of the most responsible substitutes.

Since the supplier of cloud computing may access the data kept in the cloud at any time, it raises privacy problems. One may adjust it or maybe wipe it off. Accessibility to cloud computing solutions in conventional classified settings and modern mobile settings provide various possibilities to acquire presence as well as collect security information elements across your facilities, systems, and also applications (Sudha, 2013).

- *Possibilities of Cloud Computing*

Though it offers many benefits, a lot of the corporate community still runs without cloud computing, which has been around for many decades. Most of the top executives in the IT sector already have favorable opinions on cloud computing and potential development of this technology. "I don't need a hard disk in my computer if I can get to the server faster carrying around these non-connected computers is byzantine by comparison" (Jobs, 2018).

A report by the International Data Group indicates that 69 percent of firms presently use cloud technology, while 18 percent want to adopt cloud computing solutions in the future.

Dell indicates that organizations investing in digital transformation, including big data, cloud, mobility, and security, see revenue growth up to 53% quicker than their rivals. As stated by Patrick (2016), more than 90 percent of enterprises in the United States already use cloud services for data management. These numbers indicate that a growing number of IT companies are acknowledging the many advantages of cloud computing. This will allow them to service their clients and significantly enhance their profit margins, since they are using cloud computing to operate their operations effectively. "The cloud enables individuals and small enterprises to easily establish enterprise-level services" (Stephan, 2011).

Cloud computing is a paradigm that facilitates on-demand network access to pooled computing resources, including networks, servers, storage, applications, and services. It has five essential elements, three service models, and four deployment models, enabling rapid provisioning and deployment with little administrative effort (NIST, 2011).

- *Challenges of Cloud Computing*

The study indicates that while cloud computing offers significant benefits, it also presents certain associated problems. In technologies like cloud computing, it comes with its own set of drawbacks, limitations and risks. This is a summary of the problems that were found in previous studies on cloud computing.

Cloud computing security is one of the problems associated with the use of cloud computing. Cloud-based services include third-party storage and security solutions. Can a firm presume that a cloud-based provider would safeguard and secure their data while using a low-cost or complimentary service? If there isn't any form of confidence and trust established within these two companies in terms of security, they may likely share users' information with others; thereby, security presents a real threat in cloud computing.

Lack of resources and skilled expertise is one of the major problems associated with the use of cloud computing companies are going through, (Half, 2019). In the next years, businesses are going to prefer technology professionals with expertise in the latest advancements in cloud computing, mobile technology, open-source solutions, big data, cybersecurity, and other relevant technologies.

Every second, it's either a firm is seeming interested in cloud computing or has already been moved to cloud services due to its speedy adoption rate. This tends to increase the workload, and so the cloud service hosting companies need continuous, rapid advancement. Firms are facing challenges in keeping with the tools because of various factors. As new tools and technologies are emerging every day, more skilled/trained employees need to grow to create some sort of balance in the industry.

Limited flexibility and control are also problems that are associated with the use of cloud computing. Cloud service providers handle computing resources which makes customers have no control over IT management aspects like physical inspection, cybersecurity, networking and configuration, reducing their IT infrastructure flexibility.

III. METHODOLOGY

A. Introduction

A research methodology is a fundamental principle that directs research, according to Dawson (2019). It establishes the general approach to researching a subject and determines the appropriate research method. This chapter outlines exactly the research techniques used in the investigation. It goes into great length on the techniques used, certain actions conducted, and the tools utilized in the gathering and processing of data required to solve the study issues. It concentrated on study design, source of data, and technique.

B. Sources of Data

- *Primary Data*

Primary data, also known as the original data, is collected based on the research questions by way of interacting with respondents (Carson, et al., 2018). Primary sources of data are obtained through qualitative and quantitative research methods.

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Surveys are a well-known primary data collection method. Many standardized questions are asked in a survey, and the answers are classified according to predefined answer categories (Joop, et al., 2005). Scholars use surveys to gather data on the observations, opinions, sentiments, experiences, or points of view of a population. The researcher may survey the field and communicate with respondents via phone, mail, or in person contact.

Observation is another source of first-hand information. The observation technique involves observing individuals, factors, and events, then measuring the results (Heap, et al., 2019). In contrast to an unobtrusive observation, which just captures participant activity, participant observation involves the researcher interacting with participants and becoming a member of their society.

Interviewing is a method generally used to comprehend the fundamental reasons and motives behind individuals' opinions, preferences, or behaviors (Rutberg et al., 2018).

Interview subjects are people who have been hand-picked because they are formal or informal information nodes and can thus provide the researcher with insightful answers to the survey questions or point the researcher in the direction of other sources of information.

Questionnaires are a useful way to collect primary data sources. You can use both closed-ended and open-ended enquiries.

Closed-ended questions aim to constrain respondents' responses, providing a dependable basis for comparative research. The purpose of the open-ended questions is to allow responders to express their opinions without restriction (Driscoll, 2011).

➢ *Secondary Data*

Secondary data were used in this research. Secondary data is information already collected by other researchers, usually for different purposes (Blumberg, et al., 2018). The internet served as a primary source for secondary data. As said by Adom Dickson (2017) of Kwame Nkrumah University of Science and Technology, the internet has expanded the pool of informational resources required to conduct high-calibre, original scientific research. The Internet offers a wealth of knowledge that may be used to build new ideas from preexisting ones.

Cloud computing: Concepts, Technology, and Architecture by Authors (Erl, et al., 2013) and Architecting the Cloud by Kavis (2014) were online books that were consulted. Both books noted that there is too much talk about cloud computing but not enough practice. For the research, experts, researchers, and professors' articles from pertinent scholarly publications were reviewed. This was done to evaluate, understand, and draw inferences from the recorded events. Online journals provide up-to-date information because they are periodically updated with fresh publications.

Online news was consulted from sites such as Ghanaweb (2020), and myjoyonline (2019) to collect business and economic information about SME practices, particularly in Ghana. Newspapers frequently feature comments or recollections of events. The reliability of the information that appears in newspapers has long been recognized. Search engines are used to retrieve secondary online data. Search engines like Google, Bing, and Yahoo were utilized to locate websites containing the pertinent data needed for the research.

C. Research Design

Research design is defined as the road map or blueprint a researcher follows in carrying out the study (Malhotra, et al., 2019). Furthermore, offering a structure and road map for the inquiry is a research design (Kuada, 2021). Teyi (2018) therefore comes to the conclusion that piloting the project starts with the study design. Saunders, et al. (2019) claim that a study approach often assigns research goal into three: exploratory, descriptive, and explanatory (Saunders, at al., 2019).

According to Bhandari (2020), quantitative research involves gathering or assembling and studying numerical data. It can be used to find patterns and median, make forecasts or projections, test causal relationships, and generalize results to a demographic.

Quantitative research is the opposite of qualitative research, it involves gathering and examining non-numerical data. (e.g., audio, video and text)

Quantitative research is extensively used in the scientific and social sciences, such as biology, chemistry, psychology, economics, sociology, and marketing. Quantitative research approach collects data via survey research in order to provide numerical statistics (Dawson, 2019). With this strategy, more individuals are often reached in less time. Labaree (2020) divides a quantitative research approach into three components:

- Sample population.
- The research approach determines your data collecting strategy.
- How you will analyze your data.

Quantitative research aims to determine the relationship between variables in a population. There is a difference in purpose between descriptive and experimental quantitative research. Descriptive quantitative research aims to find relationships between variables that only occur once. Experimental quantitative research endeavours to gauge the correlation between variables before and after, determining the origin and impact of the studied phenomenon (Sam, 2020).

The study employed a qualitative research design. It also employed a descriptive research design to provide a clear picture of cloud computing practices among SMEs and the contemporary trends, possibilities, and challenges. The primary rationale for employing a descriptive study design stems from the limited understanding of the current situation,

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which makes it difficult to understand and characterize the variables of interest. This approach is appropriate for this type of study, especially given the limited amount of empirical research conducted on the subject.

Qualitative research techniques use analytical tools to probe people's experiences, attitudes, and behaviors. Usually requiring fewer participants, this kind of method gives more time with each one of them. It lets study participants provide their own viewpoint on a given issue. In addition to focusing on describing and explaining events as they transpire in a regular, everyday natural setting, Blease and Cohen (2019) claim that qualitative research lets circumstances unfold naturally without attempting to control behavior. According to Bailey (2020), the researcher serves as the main tool for data collection, gathering, and analysis in qualitative studies.

IV. SUMMARY, CONCLUSION AND IMPLICATIONS

- *Introduction*

This chapter presents a synthesis of the findings and formulates a conclusion based on them. This chapter additionally discusses the implications of the findings and proposes avenues for further investigation.

- *Summary*

According to the goal of the study, the results demonstrate that companies who use cloud computing have larger profit margins, reduced operating expenses, and are better able to serve their consumers. Without having to worry that the system would take over their time and resources, organizations can therefore concentrate on their core competencies. SMEs have adopted three models of cloud computing: infrastructure as a service, platform as a service, and software as a service. The results also demonstrated that for cloud computing to succeed, five requirements must be met, including scalability and elasticity, a clearly defined service interface, tracking of service usage to implement multiple payment models, sharing of resources to achieve economies of scale, and services should be delivered through internet protocols.

The findings also showed how SMEs may become more inventive and competitive by adopting cloud computing because it allows them to avoid making significant investments in hardware and software. Every country relies on SMEs as its economic foundation. Nearly 98% of all enterprises in the US economy are categorized as SMEs. A company with 10 employees is considered a small enterprise under European law. SMEs are regarded as non-subsidiary, autonomous businesses that employ fewer than a given number of employees.

Companies with less than 10 workers are classified by the Ghana Statistical Service as small-scale businesses and those with more than 10 as medium and large-scale businesses. In Ghana, SMEs are reported to contribute up to 85% of employment and 70% to the country's GDP. The findings show how SMEs fail within a few years of establishment due to many related reasons to finance. The statistics show that after a decade, 70% of small businesses fail. This demands creative ideas within the SMEs to raise survival and growth rates. By using cloud computing services, SMEs may seize chances that let them participate in an innovative ICT environment and provide the level playing field required to thrive in business.

One of our objectives was to examine the elements that affect SMEs in Ghana's adoption of cloud computing. The results demonstrated that small enterprises have continued to adopt cloud computing at a relatively low rate, mainly because of the threat of security, privacy, and trust issues that accompany it. Another hindering factor is the lack of affordable broadband access in Ghana, as well as the challenge of data migration between vendors. Despite the numerous benefits and potential risks of cloud computing, businesses often overlook the impact of a cloud migration strategy regarding their decision to adopt cloud computing. Migration to the cloud involves complex processes that take a lot of time and resources. To fully reap the benefits of cloud computing, cloud providers and SMEs must devise a migration strategy that encompasses identifying the need for cloud services, enhancing the efficiency and resilience of their IT systems, experimenting with new ideas, and establishing more flexible and agile operations.

High-capacity networks, affordable computer systems, the fostering of equipment virtualization, and services-oriented design have caused development in cloud computing. The following were found to be the trends in cloud computing: Driven by ultra-fast 4G mobile networks and very feature-rich smart gadgets, mobile cloud computing has effectively entered the mobile space.

The rise of cloud containers, which are ultramodern containers, suggests running numerous applications on a single host. From a security perspective, cloud computing is considered the most reliable option for identity management and protection.

The findings on cloud computing prospects discussed how cloud computing has progressed from no adoption to some adoption and how the majority of leaders in the IT sector have already forecast its future success. According to reports, 69% of businesses are using cloud technology today.

While cloud computing has many tempting advantages, it also inevitably has issues. According to the findings, the challenges faced by SMEs using cloud computing include the following: a lack of resources and skilled expertise; a lack of flexibility and control since cloud service providers manage computing resources; a security issue because cloud-based services involve third-party storage and cloud providers may likely share a company's users' information with another.

- *Conclusion*

Cloud computing is becoming more popular, and the adoption rate is increasing significantly day by day, mainly because it is beneficial for both larger and smaller businesses. The study concludes that cloud computing adoption by SMEs contributes to the improved organizational performance of

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SMEs, particularly in Ghana. The existence of cloud computing has helped to overcome huge infrastructure and software expenses, thereby stimulating economic growth, because there is little discussion of cloud migration strategies. Businesses that adopt cloud computing services often run into difficulties during the migration process and service implementation. This results in a low rate of cloud adoption among SMEs. SMEs typically receive cloud computing services on a pay-as-you go basis, which greatly lowers their expenses because they do not need to purchase or develop it in-house. Cloud computing gives SMEs growth potential, and the prospects are enormous. However, potential challenges that SMEs may encounter are inevitable.

- *Implications for Future Studies*

Cloud computing helps small firms to become more agile, resilient, and connected. This means SMEs become more efficient and effective in delivering their service to the market. SMEs in general contribute immensely to a country's GDP and reduce the unemployment rate. This shows a positive relationship between cloud computing adoption and the organizational performance of SMEs.

The study's conclusions will benefit academic research and corporate practice. Students, lecturers, and other researchers who might undertake future research into cloud computing practices among small and medium-sized organizations, the contemporary trends, prospects, and obstacles, should use this study as a source of reference for academic reasons. It would also act as a guide for important decision-makers and business professionals working with SMEs and cloud computing.

RECOMMENDATION

As technology evolves, old technologies become obsolete. It is recommended that further research be conducted to review new cloud technologies and services that SMEs can adopt to gain a competitive advantage.

A comprehensive national ICT policy or development framework should include cloud computing. It will influence the creation of workable technology plans by policymakers and organizations that can boost SMEs' adoption and use of cloud services. An increase in broadband availability and affordable access to high-speed internet for small enterprises should be prioritized.

Moreover, service providers must provide suitable training and give complimentary migration training as an integral component of the adoption process, enabling SMEs to effectively manage and value the services and applications provided. We must enhance cloud services that smoothly interact with the established IT systems used in the SME sector to guarantee interoperability.

Another advantage is doing a longitudinal research. Most of the SMEs not employing cloud computing solutions want to eventually use cloud computing. It helps one to understand if they planned to utilize cloud computing due to the hype cycle the cloud is in or whether they would really incorporate it into their activities. Observational studies also determine whether businesses using cloud computing now keep using the technology and if consumers of it are happy with it.

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