The Roles of Cloud Technology in the Educational System of Nigeria

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ABSTRACT

This study was sought to know the roles of cloud technology in the educational system of Nigeria. Cloud technology fundamentally changed the IT economy, introducing new opportunities, new business models, and a whole new business era. cloud technology is the storing and accessing data and programs over the internet instead of your computer's hard drive. Ultimately, the "cloud" is just a metaphor for the internet. Cloud technology has become the ideal way to deliver enterprise applications and the preferred solution for companies extending their infrastructure or launching new innovations. The study concluded that the cloud technology is a set of active network services, providing scalability, quality of service, an inexpensive computing infrastructure which can be accessed in a simple way. The roles of cloud technology in the educational system of Nigeria, we also identified and reviewed the roles facing the cloud technology in the educational system of Nigeria of which security risk and unawareness is of the greatest concern. The shift towards cloud technology would enable educational institutors to save money and take benefit of the developing technology. One of the recommendations made was that the government should take care of the enumerated problems facing cloud technology in the educational system of Nigeria.

KEYWORDS: Roles of Cloud Technology, Educational System and Nigeria

Introduction

Information and communication technology has been in transforming state from time to time. Presently, the world is witnessing one of its transformation with cloud computing. Cloud computing has potential to penetrate into education, transaction, collaboration, information sharing and other areas of life. Cloud computing is a network of computers that work together performing different functions such as storage, processing and delivery of a large amount of data. These computer networks are inside warehouse across the world as Data centres hosting in the cloud to tap what exist from large forms of renting computing power and also storage facilities by paying for what they use as it is done through electricity and water with the aid of meters for what has been used (Sogbeye, Ekpu, & Udoh, 2019). Cloud technology can be used to seek skills which will enable users to update their knowledge on daily basis. It is use to create records and files: storing these created files amongst educators and learners (Ariwa, Ibe-Ariwa &I be, 2014). Ernst and Young (2011) stated that teaching materials can be made available through the provision of cloud services to educate the client users on the available risk management. Some researchers have considered cloud computing as a technological revolution of the twenty-first century which will go a long way towards resolving issues concerning corresponding technology between domestic and foreigner.

Information communication technology (ICT) are powerful enabling tool for educational change and reform, introducing new methods of teaching and conducting, as well as provisioning of educational facilities for online research and teaching. The history of cloud technology start way back in the 1960s, when an intergalactic computer network" was first suggested, and in recent years the technology has served to shake up both the enterprise IT and supplier landscape (Mohamed 2018). The cloud technology is another method for computer that intends to give better correspondence style and capacity using the web stage. Research has shown that cloud technology has played a catalytic role in boosting education in the world, i.e. teaching and learning process. Cloud technology service covers a range of options row, from the basics of storage networking, and processing power as well as standard office applications. cloud technology is still at a relatively early stage of adoption, despites it's long history. The economics of moving to the cloud may be less clear-cut. As a result, cloud technology as an agent of digital transformation instead of focusing simply on cost. Education has a lot to benefit from cloud computing such as cost saving, staffing, third party reliance, maintenance, upgrading, more storage space, back-up and recovery, quick and easy access to information among others (Viswanathan, 2015). It also has its challenges such as availability of services, performance unpredictability, Data lock-in, bugs in large distributed systems among others (Armbrust, 2009). Despite these challenges the entire world, especially the developing countries may see a transformation in the education industry with the emergency of the new technology.

Conceptual Review

Concept of Cloud Technology

Cloud technology can be defined as a model for enabling ubiquitous, convenient and on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort from the user side and minimal service provider interaction. Cearley (2009) defines cloud technology as a model where technological capabilities are scalable and elastic, and they are provided as a service to end-users over the Internet. Cloud technology is simple define as a cloud computing that involves delivering different types of services over the Internet. From software and analytics to secure and safe data storage and networking resources, everything can be delivered via the cloud. cloud technology means improved collaboration and productivity, as well as significant cost reductions. It means better data protection, improved availability, and expanded access to cutting-edge technologies (phoenixNAP 2021). According to Buyya (2008), the cloud technology is a distributed and parallel system consisting of a collection of virtualized and interconnected computers that are managed dynamically and posing as one or more unified resources. It can be an application you access through the Web or a server like Gmail and it can be also an IT infrastructure that can be used as per user's request. Cloud technology is the storing of information on OneDrive, SharePoint, or an email server and much different from keeping that data on a desktop hard drive or a USB stick. You can access it from just about any computer that has internet access.

Cloud technology is the use of off-site systems to help computers store, manage, process, and/or communicate information. These off-site systems are hosted on the cloud (or the internet) instead of on your computer or other local storage. They can encompass anything from email servers to software programs, data storage, or even increasing your computer's processing power (Network Coverage 2018). The "cloud" is a term that simply means "the internet." Technology involves the infrastructures and systems that allow a computer to run and build, deploy, or interact with information. In cloud computing, this means that instead of

hosting infrastructure, systems, or applications on your hard drive or an on-site server, you're hosting it on virtual/online servers that connect to your computer through secure networks. Cloud computing is possible because of a technology called virtualization. Virtualization allows for the creation of a simulated, digital-only "virtual" computer that behaves as if it were a physical computer with its own hardware. The technical term for such a computer is virtual machine. When properly implemented, virtual machines on the same host machine are sandboxed from one another, so they don't interact with each other at all, and the files and applications from one virtual machine aren't visible to the other virtual machines even though they're on the same physical machine (Cloudflare 2021). Armbrust (2010) states Actually, there is nothing new in any of the technologies that are used in the cloud computing where most of these technologies have been known for ages. It is all about making them all accessible to the masses under the name of cloud computing. Cloud is not simply the latest term for the Internet, though the Internet is a necessary foundation for the cloud, the cloud is something more than the Internet. The cloud is where you go to use technology when you need it, for as long as you need it. You do not install anything on your desktop, and you do not pay for the technology when you are not using it. The cloud can be both software and infrastructure. Cloud computing is considered the evolution of a variety of technologies that have come together to change an organizations' approach for building their IT infrastructure.

Types of Cloud Technology

In contrast to the models discussed above, which define how services are offered via the cloud, these different cloud deployment types have to do with where the cloud servers are and who manages them (Cloudflare 2021). The most common cloud deployments are:

Private cloud: A private cloud is a server, data center, or distributed network wholly dedicated to one organization. The cloud infrastructure is provisioned for exclusive use by a single organization comprising multiple consumers for example, business units. It may be owned, managed and operated by the organization. Like minded education or research organization can use a shared cloud infrastructure or single institutions can take advantage of specific cloud technologies such as virtualization enabled self-provisioning of application environment (ORACLE 2011).

Public cloud: A public cloud is a service run by an external vendor that may include servers in one or multiple data centers. Unlike a private cloud, public clouds are shared by multiple organizations. Using virtual machines, individual servers may be shared by different companies, a situation that is called "multitenancy" because multiple tenants are renting server space within the same server. The cloud infrastructure is available to the public on a commercial basis by a cloud service provider. This enables a consumer to develop and deploy a service with very little financial outlay compared to the capital expenditure requirement normally associated with deployment options.

Hybrid cloud: Hybrid cloud deployments combine public and private clouds, and may even include on-premises legacy servers. An organization may use their private cloud for some services and their public cloud for others, or they may use the public cloud as backup for their private cloud.

Multi-cloud: Multi-cloud is a type of cloud deployment that involves using multiple public clouds. In other words, an organization with a multi-cloud deployment rents virtual servers and services from several external vendors – to continue the analogy used above, this is like leasing several adjacent plots of land from different landlords. Multi-cloud deployments can also be hybrid cloud, and vice versa.

Concept of Education

Education is the process of facilitating learning, or the acquisition of knowledge, skills, values, morals, beliefs, and habits. Education is the act or process of imparting or acquiring general knowledge, developing the powers of reasoning and judgment, and generally of preparing oneself or others intellectually for mature life (Wikipedia 2018). Education may also be defined as a purposive, conscious or unconscious psychological, sociological, scientific and philosophical process which brings about the developments of the individual to the fullest extent and also the maximum development of society in such a way that both enjoy. An educational system refers to the economic and social factors that typically make up public schools at the federal state or community levels, such factor includes public funding, school facilities, staffing, compensation, employee benefits, teaching resources and more Educational system encompasses three different sectors, Basic education (nine years), Post basic, senior secondary education (three years) Tertiary education (four to six years, depending on the program of the study). The first national policy on education was developed and adopted in 1982, since this period, the educational system has witnessed a lot of changes and modification at various levels.

Roles of Cloud Technology in Educational System

Cloud technology in educational system of Nigeria helps student, teachers and administrators alike, it allows student access to homework wherever there is an internet connection. It also allows teachers to instantly upload learning materials and administrators to easily collaborate with one another and save money on data storage. A survey conducted showed that cloud technology is still playing an increasingly important role in higher education in the modern world. Higher education deals with cloud technology service because of it economic advantages, increased productivity, improved learning strategies and knowledge penetration. Companies can move faster on projects and test out concepts without lengthy procurement and big upfront costs, because firms only pay for the resources they consume. It is also easier to scale up a wildly popular application faster because of the elastic nature of the cloud.

Cloud technology offers more support for improving research and education as compared to earlier IT systems. Mass amount of information are made available via cloud through any device type. It offers to universities the possibility of concentrating more on teaching and research activities rather on complex IT configuration and software system (MCREA 2010). Cloud technology offers more flexibility to the institutions of higher learning as trainers can easily connect with the learners from a different location. The system is typically managed on multiple systems, meaning the need for full system downtime is decreased.

Impact of Cloud Technology in Educational System of Nigeria

Cloud technology have positive impact on the educational and business organization as it increases their organization and help them to achieve their business goals. The cloud impacts the society by making computing power more accessible to people around the world and lowering the barriers to entry for business. (Deloitte 2018). In terms of employment cloud technology could lead to additional system, as well as a reduction of the unemployment rate. Cloud potentially save labour as they do not have to maintain or update their systems anymore or as traditional IT roles within organizations. Large and relatively new server farms of cloud service data in a highly energy efficient manner. furthermore, over provisioning of IT infrastructure can be avoided at the educational, business and government level. Britto (2012) have opined that the cloud offers service to student in the forms of application owning of software, which is accessed with the web browser. Cloud technology has a transformable

impact and provides a broad range of benefits. In terms of financial implications cloud technology offers a set of financial benefit and have a positive economic impact. However due to the variety of different implementations of cloud technology and deployment models is rather new, there is significant uncertainty and wide variations in estimate exist. Studies by Britland (2013) asserted that despite the fact that technology can be a barrier to teaching and learning, they are very optimistic that the cloud will go a long way to remove this barrier. The authors averred that teachers can use the cloud to set, collect and grade work online; students can have instant access to grades, comments and work via the computer, smartphone or tablet. Thus with the emergences of cloud computing, students learn independently, here they take ownership of their own learning, thus teachers could easily adopt a flipped classroom approach. Also with the emergence of e-learning (massive open online resources), which may be documents, videos, and audio podcast or interactive images among others, which can be easily accessed by students via the internet. These can thus, address some of the inadequacies in tertiary educational system, and therefore give hope to the use of the cloud if properly applied.

Conclusion

The study concluded that the cloud technology is a set of active network services, providing scalability, quality of service, an inexpensive computing infrastructure which can be accessed in a simple way. The roles of cloud technology in the educational system of Nigeria, we also identified and reviewed the roles facing the cloud technology in the educational system of Nigeria of which security risk and unawareness is of the greatest concern. The shift towards cloud technology would enable educational institutors to save money and take benefit of the developing technology.

Recommendation

1. The government should take care of the enumerated problems facing cloud technology in the educational system of Nigeria.
2. Government should incorporate cloud technology in their everyday activity most especially the laboratory activities in order to help foster effective and comprehensive performance.
3. Government should improve the access to cloud technology, reduce cost of access, increases monitoring for security purposes and protect local content.

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