
CLOUD TECHNOLOGY AND ITS IMPLICATION FOR ENTREPRENEURSHIP

Okorie, Patrick Nnadozie

Patrick7okorie@gmail.com

Department of Management
Faculty of Management Sciences
University of Port Harcourt

Professor B. Chima Onuoha

benedict.onuoha@uniport.edu.ng

Department of Management
Faculty of Management Sciences
University of Port Harcourt

Abstract

In terms of driving positive social and economic transformation and new product development, entrepreneurship is vital. While many things influence the rate of new business formation in any given society, digital technologies, and especially cloud computing, have been among the most game-changing innovations since the industrial revolution. This research aims to examine cloud computing and its effects on business in emerging economies like Nigeria. For this qualitative study, we surveyed previously conducted research on the impact of cloud computing/technology on creating new businesses. This paper draws on an examination of existing literature to conclude that while businesses can expand internationally without cloud computing (for example, by using the services of expensive local data centres that are unable to scale and setting up offices and distribution hubs in the many nations and regions where they operate), the rise of cloud computing is here to stay and can be considered as the most lucrative and cost-effective strategy for SMEs to expand internationally. On the other hand, company owners, managers, and supervisors in growing economies like Nigeria need to take into account a number of factors and ramifications.

Keywords: Cloud Technology, Entrepreneurship, Technology

Introduction

There is a consensus that entrepreneurship is beneficial to national economies and that entrepreneurs play a crucial role in fostering and sustaining this asset (CPA Ireland, 2022). It is an evolving procedure that benefits everyone involved by producing more income and better living conditions. The importance of entrepreneurship cannot be overstated since it plays a crucial role in fostering societal change and fueling innovation (Ribeiro-Soriano, 2017). Successful business owners may affect widespread social and economic change. If their ideas catch on, they could raise living standards, and if their businesses take off, they could help in the economy's growth by providing people with meaningful work (Robbins & Coulter, 2018). Therefore, the significance of becoming an entrepreneur is not something that should be minimised.

Kim et al. (2022) pointed out that many factors affect the amount of entrepreneurial activity in a society, but digital technologies have been one of the most important since the industrial revolution. In order to thrive in today's hyper-data-driven world rife with novel means of transmitting, storing, creating, sharing, and exchanging data, businesses and families have shifted their productive systems, routines, and consumption habits (Jung & Gómez-Bengochea, 2022). This transformation is so extensive that it has been likened to other significant disruptions in history, such as the industrial revolution, the introduction of advanced transportation networks, and the widespread adoption of electricity (Jordan & León, 2011; Katz et al., 2013; Mack & Faggian, 2013).

Everything that is cutting edge in technology now is digitalized. A number of significant phenomena in innovation, entrepreneurship, and management studies have been named, including artificial intelligence (AI), the internet of things (IoT), big data blockchain, and digital multiple transformation (Ahlstrom et al., 2020; Nambisan et al., 2019; Si et al., 2022). In particular, the advent of digital technology has reshaped the contemporary business and management landscape by disrupting established ecosystems, updating outdated paradigms of governance and management, and therefore accelerating economic expansion (Beliaeva et al., 2019; Tomizawa et al., 2020).

The necessity for traditional storefronts and other physical locations has been greatly diminished by information and communication technology (ICT) or digital technology, which has led to a dramatic decrease in the cost of launching a business (Kim et al., 2022). Simply put, ICT increases output by lowering the price of communication and information. The growth of low-cost market access, improved collaboration with other companies, and exposure to new inventive ideas are all direct benefits for entrepreneurs. In addition, digital technology was a major factor in the resilience of COVID-19's business community (Kim et al., 2022).

Using technological advancements that can help organisations save time and money is one approach to streamlining operations and boosting efficiency, as stated by Aeologic (2022). Automation, big data, mobile technologies, social media, and cloud computing are only a few examples of these developments in the digital and technical spheres (Aeologic, 2022). The focus of this study is cloud computing or cloud technology. Instead of using on-premises servers for data storage, administration, and storage, a cloud computing (CC) service uses a network of distant servers housed on the internet (Anyeme, 2021).

One of the newest forms of advanced technology that has the potential to significantly aid businesses, especially SMEs, in developing nations is cloud computing. This is because it may provide SMEs with access to information and communication technology (ICT) resources without the need for hefty initial investments or the hiring of highly trained personnel (Mazumdar, 2018). However, most businesses in underdeveloped nations like Nigeria are not yet making widespread use of this technology due to a number of factors that make widespread adoption difficult. As a result, we hope to learn what kind of impact cloud computing can have on businesses through this paper.

Literature Review

Theoretical Framework

Theory of Technology-Organization-Environment (TOE)

Historically, the field of organisational psychology has made use of a framework known as technology-organization-environment (TOE). This theory, established by Tornatzky and Fleischer (1990), is a framework for incorporating several perspectives at the organisational level. The technology-organization-environment theory (TOE) is a framework for analysing how different factors in a company affect the rate at which new technologies are adopted and put to use (Baker, 2011). This framework delves into the ideas and framework that have proven useful in previous research by breaking them down into three categories: technological, organisational, and environmental.

Firstly, we have technology concerns, both inside and outside the organisation (Baker, 2011). Technology in the business's context include both the software, hardware, technical challenges, IT infrastructure, and other technological practises already in use, as well as those technologies available on the market but not yet employed by the firm (Baker, 2011). The framework's second part reflects the organisational context, which is largely concerned with the characteristics and qualities of the business firm, such as the size of the company and its management structure (Alshamaila et al., 2012). As a corollary, this second part of TOE theory refers to the internal and external stresses that the company faces, including policies, principles, and of course, market competition. The third component of TOE theory is the environmental context, which is the setting in which a company operates. It may be linked to factors in the surrounding environment, such as technological developments, rival firms, the nature of the business itself, and the presence of technology service providers (Alshamaila et al., 2012). All three components of the TOE framework, as described by Tornatzky and Fleischer (1990), are seen as potential drivers and barriers to technology adoption.

Technology in the TOE model represents not only the qualities of the technology but also its accessibility. Technologies that have an internal or external bearing on the company and that are considered part of the technological element Existing technology within the firm and external technologies that are not now part of the firm might nonetheless affect the choice to embrace technology, as stated by Tornatzky and Fleischer (1990). In contrast to external technologies, which might describe how a company can transform through the adoption of new technologies, an organization's present technology can limit the potential and bounds of the conceivable technological changes that it can embrace. Furthermore, Tornatzky and Fleischer (1990) argued that external technology not currently utilised by the corporation might provide incremental, synthetic, or intermittent modifications. Since gradual changes to existing technologies can improve their capacity to support new kinds of structures, this approach carries only negligible risks.

The TOE framework's organisational component specifies the nature and characteristics of the company, including its size, organisational structure, and method of internal communication. Several aspects of an organisation can affect the choice to embrace new technology, while the structure of the business has an impact on the adoption process. Baker (2012) noted that decentralised organisations are best suited for the modernization phase of the transformation process, whereas centralised firms are best suited for the execution phase. Furthermore, the communication process is an important organisational aspect in the company's adoption process. The actions of upper-level managers can also help or hinder some aspects of technology adoption. When it comes to the rate at which new ideas are adopted, "the effect of scale is not yet understood," as stated by Baker (2012). On the other hand, there are a few schools of thinking inside the company on the value of idle resources. According to Baker (2012), having spare capacity is good for business, but it does not help with transformation in and of itself.

The TOE framework's environmental component includes the organisational and technological foundations of the business and the many laws and policies that regulate it. Because the technology adoption process is unclear inside immature or declining organisations, academics like Baker (2012) argue that the rate of adoption is much greater in rapidly rising firms compared to considerably slower advancing firms. Availability of trained labour is another environmental issue that affects how quickly technologies are adopted. The impact of government laws on the adoption process is murky, however, because such restrictions may either facilitate or hinder the spread of revolutions (Baker, 2012).

Mazumdar (2018) used the Theory of technology-organization-environment with the Cloud Lifecycle Model to determine the causes of cloud computing's slow acceptance, and to suggest ways to speed up that process using iterative approaches.

Cloud Technology/Computing

With the advent of cloud computing, users may get the services they need from a remote server at any time of day or night. This represents a significant shift in the way that technology is used and a breakthrough in the way that businesses and individuals work together (Anyeme, 2021). Cloud computing is a relatively recent technological and communication innovation in computing that has helped large and small businesses alike maximise their IT performance with minimum investment in new hardware and software. The growing popularity of cloud computing among both large corporations and small and medium-sized enterprises is due to the fact that it promotes rapid innovation by providing both resource flexibility and economies of scale. The five defining characteristics of cloud computing are as follows: on-demand self-service, widespread network access, resource pooling, quick elasticity, and metered service (Peter & Grance, 2011).

Challenges of Cloud Technology Adoption

In spite of the fact that there are substantial drives for the implementation of cloud computing, there are still some notable hurdles. Researchers Ghaffari et al. (2014) discovered that worries about online data security are a key barrier to the widespread usage of cloud computing. Adoption is hindered by more than just security concerns. Outages, provider portability, and lack of trust are all important obstacles to cloud computing's widespread use (Voorsluys et al., 2011; Zissis & Lekkas, 2012). Political concerns and international borders may also provide difficulties. Locations of data storage, data processing, and data access all vary in the cloud computing environment (Ghaffari et al., 2014). Because of this variety, it might be difficult to enforce privacy laws. Government engagement in standardising and regulating the adoption process for cloud computing, for both providers and customers, has

grown in importance as laws and regulations vary greatly among political situations (Ghaffari et al., 2014).

Prospects of Cloud Technology/Computing and Entrepreneurship

Advancements in technology have meant that the old talents and goods are losing their appeal (Pauly, 2011). As a result of these developments, businesses everywhere are losing competitiveness, but especially small and medium-sized enterprises (SMEs) in emerging nations like Nigeria. This is due to a lack of access to modern skills necessary to carry out IT operations, as well as a scarcity of available resources and competitive advantages among SMEs (Khan, 2015). Small and medium-sized enterprises (SMEs) in emerging markets must act swiftly to reap the benefits of these opportunities (Dillon et al., 2010). Hence, organisations should adopt new ways, which contain hi-tech solutions that may contribute to invention, reduce price and increase implementation quickness (Khan, 2015). In current information technology and globalisation era, computer control and business vision may deliver competitive benefits to firms (Liu & Orban, 2010).

According to Khan (2015), firms in emerging economies have a number of challenges in the global commercial market, but with the help of cutting-edge IT infrastructures, these challenges may be eliminated. This is due to the SMEs' innate adaptability, which helps them modernise and streamline their operations (Khan, 2015). According to Khan's (2015) research, despite the challenges associated with cloud adoption, SMEs are drawn to the technology because of its unique qualities, such as its adaptability, practicality, and on-demand provisioning. Abdollahzadehgan et al. (2013) established a list of advantages of cloud computing (CC), which may inspire a corporate organisation to use cloud computing. The report also includes a discussion of the disadvantages of cloud computing, but its primary focus is on the benefits that small and medium-sized enterprises (SMEs) can reap from making the switch. Abdollahzadehgan et al. (2013) admonished that small and medium-sized enterprises (SMEs) should embrace cloud computing since they lack the human capital and financial resources to acquire the effective IT prerequisites necessary to deal with a tough market. After examining the data critically, they discovered a number of characteristics that contribute to the successful adoption of cloud computing by enterprises. The results showed that "technical problems" including compatibility and complexity are driving forces behind SMEs' embrace of cloud computing.

Conclusion and Implications

This paper recognized the fact that entrepreneurship is pivotal to economic growth and development, and has been impacted by rapid advancement in digital technologies like cloud technology. Based on an analysis of previous research on the topic, this paper concludes that, while businesses may expand internationally even when not using the cloud—by, for example, hiring the services of pricey local data centres that are unable to scale and creating offices and distribution hubs in the many nations and regions where they operate—the rise of cloud computing is here to stay and can be considered as the most lucrative and cost-effective strategy for SMEs to expand internationally. This is however, not without certain implications for owners, managers and supervisors of businesses in developing economies like Nigeria.

In order to begin the process of migrating a company's infrastructure to the cloud, they will need to hire a cloud expert who can advise them on the best cloud service provider to use and the steps to take. It is also important for managers, owners and supervisors of business, especially small and medium scale enterprises in emerging economies, to remember that a reliable internet connection is essential for cloud computing and technology. Because of this, it may seem like a pipe dream for small and medium-sized enterprises (SMEs) in less

developed or under develop nations with inadequate internet network infrastructure at the time, but this may change since development is continual.

References

- Abdollahzadegan, A., Hussin, C., Razak, A., Moshfegh Gohary, M., & Amini, M. (2013). The organizational critical success factors for adopting cloud computing in SMEs. *Journal of Information Systems Research and Innovation*, 4(1), 67–74.
- Aeologic (2022). *Importance of technology advancement in the business sector*. Aeologic. <https://www.aeologic.com/blog/importance-of-technology-advancement-in-the-business-sector/>
- Ahlstrom, D., Arregle, J. L., Hitt, M. A., Qian, G., Ma, X., & Faems, D. (2020). Managing technological, sociopolitical, and institutional change in the new normal. *Journal of Management Studies*, 57(3), 411-437.
- Alshamaileh, Y., Papagiannidis, S., & Li, F. (2012). Cloud computing adoption by SMEs in the North East of England: A multi-perspective framework. *Journal of Enterprise Information Management*, 26(3), 250-275.
- Anyeme, K. (2021). *Cloud computing from the perspectives of small and medium-sized enterprises (SMEs)*. (A Doctoral Thesis, Centria University of Applied Sciences).
- Baker, J. (2011). The technology-organization-environment framework, in Dwivedi, Y., Wade, M. and Schnegerger, S. (eds.) *Information Systems Theory: Explaining and Predicting Our Digital Society*. New York: Springer.
- Baker, J. (2012). The technology-organization-environment framework. *Information Systems Theory*, 28, 231 – 245.
- Beliaeva, T., Ferasso, M., Kraus, S., & Damke, E. J. (2019). Dynamics of digital entrepreneurship and the innovation ecosystem: A multilevel perspective. *International Journal of Entrepreneurial Behavior & Research*, 26(2), 266-284.
- CPA Ireland (2022). *Importance of entrepreneurship*. CPA Examinations Team for Foundation Level Management Fundamentals.
- Dillon, T., Wu, C., & Chang, E. (2010). *Cloud computing: Issues and challenges*. (In Advanced Information Networking and Applications [AINA], 2010 24th IEEE International Conference on, pp.27-33).
- Ghaffari, K., Delgosha, S. M., & Abdolvand, N. (2014). Towards Cloud Computing: A SWOT Analysis on its adoption in SMEs. *International Journal of Information Technology Convergence and Services*, 4(2), 13-20.
- Jordán, V., & León, O. D. (2011). *Broadband and the digital revolution*. In: *Fast-tracking the digital revolution: Broadband for Latin America and the Caribbean*. Santiago: ECLAC, 2011, 13-47. LC/R. 2167.

- Jung, J., & Gómez-Bengochea, G. (2022). A literature review on firm digitalization: drivers and impacts. *Studies on the Spanish Economy*, eee2022-20, FEDEA.
- Katz, R., Koutroumpis, P., & Callorda, F. (2013). The Latin American path towards digitization. *Info*, 15(3), 6-24.
- Khan, I. (2015). *Why business (SMEs) should adopt cloud computing*. (Business Information Technology, Oulu University of Applied Sciences).
- Kim, J., Petalcorin, C. C., Park, D., Jinjarak, Y., & Quising, P. (2022). *Entrepreneurship and economic growth: A cross section empirical analysis*. (Asian Development Outlook 2022 Update: Entrepreneurship in the Digital Age).
- Liu, H., & Orban, D. (2010). Remote network labs: An on-demand network cloud for configuration testing. *ACM SIGCOMM Computer Communication Review*, 40(1), 83–91.
- Mack, E., & Faggian, A. (2013). Productivity and broadband: The human factor. *International Regional Science Review*, 36(3), 392-423.
- Mazumdar, A. (2018). *Adoption of cloud computing in the SMEs: An exploration of the issues and challenges for adoption of cloud computing by SMEs in Bangladesh in the context of "Digital Bangladesh."* (A Doctoral Thesis, University of Wales Trinity Saint David).
- Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. *Research Policy*, 48(8), 103773.
- Pauly, M. (2011). *T-Systems cloud-based solutions for business applications. Cloud Computing: Principles and Paradigms*. John Wiley & Sons.
- Peter, M. & Grance, T. (2011). *The NIST Definition of Cloud Computing*. NIST. www.nist.gov/sites/default/files/documents/itl/cloud/cloud-def-v15.pdf. Accessed January 2020.
- Ribeiro-Soriano, D., 2017. Small business and entrepreneurship: their role in economic and social development. *Entrepreneurship & Regional Development*, 29(1-2), pp.1-3.
- Robbins, S. P., & Coulter, M. A. (2018). *Management* (14th ed). Pearson.
- Si, S., Hall, J., Suddaby, R., Ahlstrom, D., & Wei, J. (2022). Technology, entrepreneurship, innovation and social change in digital economics. *Technovation*, 102484.
- Tomizawa, A., Zhao, L., Bassellier, G., & Ahlstrom, D. (2020). Economic growth, innovation, institutions, and the Great Enrichment. *Asia Pacific Journal of Management*, 37(1), 7-31.
- Tornatzky, L. G., & Fleischer, M. (1990). *The process of technological Innovation*. Lexington: Lexington Books.

Voorsluys, W., Broberg, J., & Buyya, R. (2011). Introduction to Cloud Computing. In R. Buyya, J. Broberg, & A. Goscinski (Eds.), *Cloud Computing: Principles and Paradigms* (pp. 1–44). New York: Wiley Press.

Zissis, D., & Lekkas, D. (2012). Addressing cloud computing security issues. *Future generation Computer Systems*, 28(3), 583- 592.