

# Infrastructural Development and Survival of Small and Medium Enterprises in North-Central, Nigeria

**OJIBA, Chinwe Vivian Nnajofo**

[nnajichinwevivian@gmail.com](mailto:nnajichinwevivian@gmail.com)

+2348034448482

Department of Business Administration

Joseph Sarwuan Tarka University, Makurdi, Nigeria

**PROFESSOR. S.T KPELAI**

+2348036807221

Deputy Centre Leader, Procurement Standards

Centre for Innovation in Procurement, Environmental and Social Standards (CIPESS)

Joseph Sarwuan Tarka University, Makurdi, Nigeria

**KORVE, Kenneth, N (Ph.D)**

+2348039103354

Department of Business Administration

Joseph Sarwuan Tarka University, Makurdi, Nigeria

**UMOGBAI Monica, E (Ph.D)**

+2348068361570

Department of Business Administration

Joseph Sarwuan Tarka University, Makurdi, Nigeria

**Abstract:** *The study examined the effect of infrastructural development on survival of small and medium enterprises in North-Central, Nigeria. The study specifically examined the effect of information and communication technology on survival of small and medium enterprises in North-Central, Nigeria. Cross-sectional survey design was adopted with simple random sampling technique for sample selection size of 399. Data for the study were collected through structured questionnaire and analyzed using descriptive statistical tools such as tables and simple percentages. In addition, multiple regressions were used for further analysis and test of hypotheses. Finding from this study indicated that information and communication technology has a positive and significant effect on the survival of SMEs in North-Central, Nigeria. Based on research finding, the study concluded that the usage of infrastructural development through information and communication technology has improved survival of SMEs in North-Central, Nigeria. It was recommended that SMEs promoters should tailor ICT capacity building programs that encourage partnership with specialized ICT organizations, Non-Governmental Organizations (NGOs), among others in building on modern trends and utilization of ICT tools through webinar/seminars, workshops, and conferences. These skills acquired by workers will help to create and deliver products and services, enhance efficiency, reduce costs, and broaden the market both locally and globally for SMEs promoters.*

**Keywords:** *Infrastructural development, information and communication technology, survival of SMEs*

## 1.0 INTRODUCTION

Governments around the world are continually looking for new strategies to increase the abilities of economies to produce goods and services. In this light, over the last two and half decades' attention has shifted to infrastructural development as a veritable tool for raising the productive capacity of the economy. Infrastructural development has been at the top of the priority list for governments all over the world. Policymakers believe that appropriate infrastructural investment holds the key to social and economic development and growth. According to World Bank (2007), improving infrastructure in the world is key to reducing poverty and increasing growth (Akyuz and Opusunju, 2020). The need for infrastructural development is indeed crucial for developing countries in Africa, most especially, Nigeria. The poor state of infrastructure has now engaged the attention of many African governments as the development of infrastructural facilities is one of the determinants of growth in any economy (Edun *et al.*, 2013). The lack of conducive and good infrastructural facilities remains a drawback to the survival, development, and performance of small and medium enterprises (SMEs). It was stated that the rise in the transaction costs of business in most African countries is attributed to inadequate infrastructure. (Habitat, 2011; Makata and Oladejo, 2019).

In the case of Nigeria, it was evidenced from the recent 2021 Micro, Small, and Medium Enterprises (MSME) survey report that weak infrastructure contributes to about 20.9% of the challenges facing business survival in Nigeria (SMEDAN, 2021). Most of the current infrastructural facilities in Nigeria were developed during the second national development plan (1970-1974). According to Ekundare (1971), as cited in Edun *et al.* (2013), it is no surprise that the main emphasis of the second national plan was on social change, which was to lay the foundation for the development of public infrastructure for productive, and consumption purposes. In many States in the country, the non-existence of infrastructure and inability to access ICT constitute one of the major problems militating against the survival of SMEs. Most of the public infrastructure across Nigeria is decayed and malfunctioning and as a result of the massive resources required for infrastructural development, there are many abandoned and uncompleted projects across the country (Nwogwugwu *et al.*, 2015). According to Nigeria's former Finance Minister, Ngozi Okonjo-Iweala, the only way to create jobs and reduce poverty in Nigeria is for government to improve infrastructure and attract private investors. Thus, a country with an ineffective infrastructure system delimits the inflow of investments (Adesugba, 2009).

Infrastructural development as operationalized in this study is the continuous provision and improvement of basic facilities and services such as ICT and so on (Oyedele, 2012). The dimension of infrastructural development employed in this study was advanced by Abur (2020), which is information and communication technology. Information and Communication Technology (ICT) has in recent times allowed businesses to expand quickly and efficiently through business technology such as video conferencing, social networks, etc. With business technology, companies can target a wider customer base and ultimately increase their sales level. Also, through the use of ICT, businesses can get closer to their main target market and bring to their awareness its product and services thereby increasing the demand for their products. Again, through ICT, businesses can provide online services and online marketing to their target market.

Survival is a state of continuing existence of an organization despite difficulty, challenges, or dangers (Obiekwe, 2018). For SMEs to thrive in a competitive world of business, they need to progressively innovate to ensure that their goods and services reach untapped customer needs. SMEs that adopt radical innovation are more likely to survive because of higher returns from adoption as a result of gaining a larger market share (Omoankhanlen and Ohiria, 2017). The survival construct employed in this study is innovation which was advanced by Obiekwe (2018). Innovation influences the performance of the organization's quality of work, information exchange, capacity for learning, and the use of new knowledge and technologies like ICT facilities, systems, and structures. Innovation has become a key tool for SMEs that strive to cope with today's highly competitive environment. Innovation captures the idea of applying creativity in the technical, marketing, and organizational functions of a firm to develop new goods and services for wealth creation. The innovative behavior of an entrepreneur can also be said to be the ability possessed by an entrepreneur to generate new ideas that are very industrious and profitable to the business and society at large.

SMEs are to an economy as enzymes are to the human body. In 2002, the Honourary Presidential Council on Investment (HPACI), SME sector profile reveals that SMEs contribute as much as 40% of GDP in developed economies and some developing nations. The report further shows that SMEs constitute over 90% of firms in Nigeria with a meager 1% contribution to GDP. This disproportionate contribution is a result of factors within the business environments (Akinyele *et al.*, 2016). The survival of SMEs largely determines the economic development of nations; this is because a critical mass of people in such countries is captured within this net. Therefore, for these SMEs to thrive, certain infrastructure must be in place to promote and encourage the activities of such businesses (Kyunga, 2017). The interest of this study is in all registered small and medium enterprises in North-Central, Nigeria because they are potential instruments of modernization and job creation. It is also a key element in the successful transformation of most economies that have sustained rises in their per-capital income and contributes 96% of the businesses (SMEDAN, 2021.) The choice of selecting this sector is due to its relevance to the economy.

Infrastructures are the basic and essential services needed to be in place to stimulate the growth of SMEs. From my casual observation, it seems infrastructure plays a major role in the economy of a country whether developing or developed. The need for good infrastructure is of great importance to businesses and their owners all over the world as well as the various sectors of the economy (Adenipekun, 2013). This may suggest that a country's ability to thrive and prosper is heavily reliant on its state of infrastructure. It may be argued that infrastructural development may not have been given desired attention by successive governments in Nigeria. It was evidenced from the most recent 2021 MSME survey report that weak infrastructure contributes 20.9% of the challenges facing business survival in Nigeria (SMEDAN, 2021). It has also been observed that most of the public infrastructures across Nigeria are decaying and malfunctioning and in recent times, private organizations have opted in providing alternative sources of infrastructure needed but despite that there is still challenge of survival. These have made SMEs burdened by

high costs of operations which may reduce the profitability of their businesses. The current state of infrastructure has not done enough to create the desired conducive environment that will encourage SMEs' survival.

It was observed by the researcher that for SMEs to respond rapidly to the challenges in the business environment depends largely on information system management. Some of these SMEs may lack the skills of information technologies like mobile phones, internet services, the use of e-mail, e-commerce, social media networking, and fixed broadband amongst others. This may affect their product demand, sales, and innovativeness. Previous studies by Akyuzt and Opusunju, (2020); Abur, (2020); Akinlemi, (2018); Orji *et al.* (2017); Akinyele *et al.* (2016), conducted on infrastructural development and SMEs growth were carried out years ago both in the Western world and Nigeria. Very few have been done on the survival of SMEs and none specifically in North-Central Nigeria using the same objective and analytical/methodological approaches till date. Also, several studies employed technology and telecommunication alone as a dimension but this study encompasses ICT as a result of the changes in the business environment as such a gap exists. This study therefore, intends to fill these knowledge gaps in the literature by studying infrastructural development (ICT) and survival (innovation) of SMEs in North-Central, Nigeria. The main objective of this study is to examine the effect of infrastructural development on the survival of SMEs in North-Central, Nigeria. Specifically, the objective is to determine the extent to which Information and Communication Technology (ICT) infrastructure affects the survival SMEs in North-Central, Nigeria

**Ho<sub>1</sub>:** Information and communication technology (ICT) infrastructure has no significant effect on the survival of SMEs in North-Central, Nigeria.

## 2.0 LITERATURE REVIEW

Literature review forms the framework as it helps to develop good understanding and provide insight into relevant previous research. It consists of the theoretical framework, conceptual framework and empirical reviews

### 2.1 Theoretical Framework

The study is anchored by theory of unbalanced development propounded by Hirschman (1958). The theory of unbalanced growth as a strategy of development to be used by underdeveloped countries. In his book, *Strategy of Economic Development* (1958), has postulated that every aspect of development includes the role of government, public policy, and institutions at large. This theory stresses the need for investment in strategic sectors of the economy instead of all the sectors simultaneously. According to this theory, the other sectors would automatically develop themselves through what is known as the "linkages effect". Hirschman is of the confirmed view that underdeveloped countries should not develop all the sectors simultaneously rather one or two strategic sectors or industries should be developed by making huge investments. Hirschman also stated that creating imbalances in the system is the best strategy for growth. Owing to the lack of availability of resources in the less developed countries, the little that is available must be used efficiently. Accordingly strategic sectors in the economy should get priority or precedence over others where income is concerned (Mirakhor, 1966).

Hirschman theory of unbalanced development nevertheless suffers many criticisms. The critics are of the opinion that deliberately introducing unbalances in the system is not so

much needed in the less developed countries. These imbalances are caused on their own due to technical indivisibility and uncertain behavior of demand and supply forces. Also, how much to invest and where to invest are not known by the theory of unbalanced growth. It only tells of the need to invest. Furthermore, Hirschman has advocated starting only those industries that have maximum linkage effect. But these effects are not based on statistical data pertaining to the less developed countries. Moreover, 'Unbalanced Growth Theory' assumes the availability of certain basic facilities in terms of necessary raw materials, technical know-how and developed means of transport. However, in less developed countries, these are insufficient. Despite the criticism, the theory is still appropriate for the study. Hirschman's theory of unbalancing development was used to justify the treatment of infrastructure as a 'lead' sector whose expansion promotes and supports the development of other sectors. In Hirschman's view, since developing countries do not possess sufficient resources for investing simultaneously in all sectors of the economy, investments in strategically selected industries or sectors of the economy will lead to new investment opportunities and so pave the way to further economic development. Nigeria is a developing country and Small and medium enterprises are the business parlance. They provide the logical starting point for big businesses. Therefore, it is expected that Government should develop the sector by making huge investments in infrastructural facilities to enhance their productivity and survival.

## 2.2 Conceptual framework

Related literatures by different authorities on the concept of infrastructural development and SMEs survival along with its dimension were reviewed.

### 2.2.1 Infrastructural Development

Akinyele *et al.* (2016), defined infrastructure as the basic physical and organizational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function. However, the term 'Infrastructure' also encompasses such facilities as ICT, Electricity, Transportation, Education, Health, etc. These facilities are essential in enhancing the survival and growth of businesses, large or small in any economy; it is therefore not surprising that infrastructural development directly correlates to the level of economic development in countries the world over. Similarly, Mesagan and Ezeji (2016), defined infrastructure as basic essential services that should be put in place to enable development to occur. Kyunga (2017), argue that Infrastructure refers to a group of elements that are interconnected and are concerned with issues or provision of a framework that supports the whole structure of development. Osei-Hwedie and Kurantin (2017), see infrastructural development as the improvement of the quality of the various components of infrastructure such as power, ICT, road, water and sanitation. The basic physical development mentioned is considered important as it serves as an indicator of the progress and developmental process of a particular country. The lack of basic facilities shows that the country or region can be categorized as underdeveloped and left behind by progress and modernization. Infrastructure development is of great significance phenomena since it leads to improvement in the ICT sector that makes access to financial resources to be cheaper and faster, thus reducing workers' time which is spent mainly on non-productive facilities, thus raising the economic return of any sector to labor.



### 2.2.2 Dimension of Infrastructural Development

The dimension of infrastructural development employed in this study was advanced by Abur, (2020), which is information and communication technology (ICT). This dimension was adopted as a result of the changes in the business environment and the peculiarity of the North-Central. Nigeria.

#### i. Information and Communication Technology (ICT) Infrastructure

Oluwaseun *et al.* (2014), in their study, defined ICT as a wide range of computerized technologies that enable communication and the electronic capturing, processing, and transmission of information which encompasses mobile phones, internet services, the use of e-mail, e-commerce, social media network, and fixed broadband, and other technologies. Pradhan *et al.* (2018), added that ICT also includes computer hardware, software, data, storage technology networks, providing portfolios of shared IT resources. The advent of modern telecommunication and its associated benefits like faster emails, electronic faxes, social networks, etc. has led to a reduced time of delivery of services. Potential benefits of ICT to SMEs include enhancing efficiency, reducing costs, and broadening the market both locally and globally, empowering SMEs to participate in the knowledge economy by facilitating connectivity; helping to create and deliver products and services on a global scale, and providing access to new markets. ICT offers SMEs flexibility in trading by enabling 24 hours of trading, borderless market space, and leveraging SMEs to compete against larger enterprises on the same platform. In addition, ICT facilitates remote access to knowledge, suppliers, and a borderless environment, offering SMEs the ability to deliver products and services on a different platform that is easily accessible. ICT can be used to reduce barriers to entry into different market segments exposing SMEs to a wider customer base (Lloyd and Kroeze, 2008).

The mobile phone is the most used ICT tool that is rated most significantly in terms of desirability, accessibility, and affordability. Mobile phones emerge as the preferred ICT tool for SMEs due to affordability, ease of use, and a reliable network. Mobile phones offer various functionalities that can enhance market access and include communication, enabling market transactions, product promotion, customer relationships, market research, and other internet-enabled services. Mobile phones offer a quick, efficient, and affordable way of communication to SMEs which is essential for initiating and maintaining customer relationships, facilitating market transactions, acquisition of market information, and communicating product information to customers. Communication can be achieved through voicemail or the short message service that is relatively cheap. With modern ICT, users of goods and services can track the location of their goods at any point in time. It is estimated that more than 80% of small businesses use mobile phones in their daily operations. This can be used for ordering goods and other activities. ICT helps business operators to design and deliver new products with unique features and redirect and redesign their business processes. The ability of SMEs to respond rapidly to environmental challenges depends largely on information system management to reflect hopes, dreams, and realities (Pradhan *et al.*, 2018).

Many organizations use computer systems to run their inventory, control accounting, manage human resources, etc. Businesses are no longer relying on trails of paperwork to conduct everyday transactions. With an installed modern computer interconnectivity

backbone, establishments can keep in touch, synchronize and coordinate activities with the utmost ease. Managers now realize that information technology can be used as an engine to speed up processes, eliminate or reduce paperwork, increase the quality of output and service delivery, decrease storage costs, and enhance information sharing and communication (Igbaekemen, 2020). ICT strategy is pivotal to competitive survival for today's businesses. It has become a pervasive part of our working and living environments and will continue to be an integral resource for business, government, and society at large. ICT combines information, knowledge, processes, and technology to provide a foundation for driving efficiencies and fueling innovation. It is the key to helping organizations of all sizes to connect, collaborate and compete more effectively (Ishida, 2015). ICT plays a very important role in helping SMEs to have a hedge over competitors in terms of accessibility to global markets. The use of ICT in many organizations has assisted in reducing transactional costs, overcoming the constraints of distance, and has cut across geographic boundaries thereby assisting to improve coordination of activities within organizational boundaries. ICT has the potential to improve the core business of SMEs in every step of the business process (Igbaekemen, 2020).

### **2.2.3 Survival of Small and Medium Enterprises**

Survival can be defined as an organizational ability or state of continuing to live or exist, often despite the difficulty, challenges, or dangers. Survival has many connotations-both subjective and objective. The most objective way to measure survival in organizations is to observe their continuing existence (Obiekwe, 2018). A business organization that wants to succeed must develop a clear understanding of the trends of the business environment and the forces that shape competition. Survival is of high importance for the enterprise to attain its goal. For an organization to strive to survive in a vibrant and competitive business environment, it wholly depends on how effectively the organization learns to innovate and adapt in the environment it finds itself and how the organization exercise dynamic capability on its resources efficiently used to the fullest (Omoankhanlen and Ohiria 2017). Survival is very crucial in this period of business turbulence, to maintain a place in this competitive era; the organization has to be more innovative. It indicates that if the organization will remain in business through interest or likeliness that the organization will continue in business in the future, it has to be more innovative (Ayatse *et al.*, 2019)

### **2.2.4 Dimensions of Survival**

The survival construct employed in this study is innovation which was advanced by Obiekwe, (2018). This dimension was chosen because it conforms to the researcher's intention.

#### **i. Innovation**

Innovation is defined by Luecke and Kart (2003), as cited in Ayatse *et al.* (2019), as a firm's capacity to engage in a new enterprise that is, the introduction of new processes/procedures, products, or ideas that provides added value to the customers and organization. The capacity to innovate is among the most important factors which influence business performance. The concept of innovation also refers to the use of new technology or new management practices in an organization to achieve a targeted improvement in its operations. From an SME perspective, innovation commonly indicates new products or processes that address customer needs more competitively and

profitably than existing ones (Nawal and Ghadah, 2021). Innovation has been known as a key element of dynamic competition and market efficiency. Therefore, innovative companies develop faster, more efficiently, and more profitable than non-innovative ones. Innovation has become a necessity for all contemporary enterprises that want to survive in a world characterized by competition, technological change, and recurring crises. Survival in today's business environment demands innovation, creativity, and improvement in performance. Such are the overwhelming challenges facing today's business managers. To compete successfully and to be productive, one must be able to survive first, especially in our fast-changing chaotic world of global competition (Obiekwe, 2018). For SMEs to thrive in a competitive world of business, they need to progressively innovate to ensure that their goods and services reach untapped customer needs. SMEs that adopt radical innovation are more likely to survive because of higher returns from adoption as a result of gaining a larger market share. The introduction of innovative products, services, and processes of business models tailored to attractive niches is an additional opportunity for SMEs to stand out from the competition. In so doing, SMEs can benefit from the high brand loyalty of buyers and reduced-price sensitivity of demand as a consequence of customers valuing the uniqueness of the innovation (Abdul, 2019).

### **2.2.5 Small and Medium Enterprises**

The term SMEs are relative and differ from industry to industry, country to country and there is no universally accepted definition of SMEs. There is no single criterion for classifying a business enterprise as small and medium scale. The definition changes over time and importantly depends upon a country's level of development. In Nigeria, the multiplicity of definitions for SMEs is the role rather than expectation. It is however possible that as a result of the difference in policy focus, different government agencies in Nigeria apply various definitions of SMEs. The Central Bank of Nigeria (CBN), in its 1990 credit guideline for financial institutions defines SMEs as those businesses whose annual turnover does not exceed N200, 000,000 or whose capital expenditure does not exceed N200, 000,000. National Council of Industries also refers to SMEs as enterprises whose total costs excluding land are not more than N200, 000,000.00 only. An SME is an independent business, having a small market share, and is managed by its owner or part-owners. There is a wide diversity of businesses, so there is no single definition of a small firm because each country has its definition of an SME Firm. SMEs have continued to be recognized as the bedrock and powerful engine room for any nation's growth and development of most economies of the world. Conversely, the SME sub-sector has continued to face various challenges that have militated against its success. The dynamic nature of the SME sub-sector makes it vulnerable to a high mortality rate caused by high uncertainty and competitiveness in the environment. However, prior studies revealed that over the past decades, the Government of Nigeria has made many efforts in boosting this sector. It has established an institutional framework consisting of industry support agencies, formulations of supporting policies and assistance from financial institutions (Amah, 2017). For this study, we shall adopt the definition and classification of SMEs as provided by SMEDAN that a small business is a legal business that operates on a full-time basis in this study area with staff strength of between 10 to 49 staff with a turnover of twenty-five million naira but less than one hundred million naira, whereas the medium business is a legal business that operates on a full-time basis in the study area with a



staff strength of between 50 to 199 and a turnover of one hundred million but less than one billion naira.

### **2.2.6 Information and Communication Technology and SMEs Survival**

According to Okundaye *et al.* (2019), the implementation of information and communication technology (ICT), in SMEs is vital for the socioeconomic development of an economy especially in developing countries. The use of ICT enables SMEs to compete at the same level as their larger counterparts in the global market. SMEs use ICT as the means to facilitate strategic planning, future research, and business forecasting for both process efficiency and effectiveness. ICT has helped SMEs achieve growth by becoming more efficient, effective, innovative, and globally competitive. One of the attributes of ICT that resulted in the successful implementation of e-commerce by SME leaders in Sub-Saharan Africa is the ability of SME leaders to see visible benefits resulting from ICT use. Such visible benefits include the ability for ICT to simplify work routines, promote efficient communication and coordination between various value chain partners, increase productivity, and improve customer service which resulted in increased customer satisfaction (Asongu and Le, 2017). The advent of modern telecommunication and its associated benefits like faster emails, electronic faxes, social networks, etc. has led to a reduced time of service of delivery (Igbaekemen, 2020). ICT enables SMEs to participate in the regional and international markets which are strategic for competitiveness, growth, and further development. ICT contributes positively and significantly to output and productivity for firms. By applying ICT, firms will become more competitive, new markets will be accessed, and new employment opportunities will be created and it will generate wealth and sustainable economic growth.

### **2.2.7 Review of Related Empirical Studies**

Review of related empirical studies is the presentation of works done by previous researchers with their topics, year of research, technique, methodology, and design approach used for data collection and analysis together with their various results of the findings and recommendations accordingly. The review of related empirical studies cut across local, regional and global perspectives.

Ranatunga *et al.* (2021), investigated empirically how Information and Communications Technology (ICT) usage affects the bounded rationality and business performance of SMEs in Sri Lanka. The data collection has been done with 400 owners of SMEs in Sri Lanka by employing telephone and face-to-face interviews using a structured questionnaire. The Partial Least Squares-Structural Equation Modelling (PLSSEM), was utilized to analyze the data. The empirical results discovered that the different dimensions of ICT usage such as infrastructure, applications, policy, human resources, and mobile technology have a negative impact on bounded rationality and positive effects on the business performance of SMEs in Sri Lanka. Thus, the study recognizes that several dimensions of ICT usage make proper information flow to pull out information asymmetry and reduce the bounded rationality of SMEs, thereby increasing the business performance of SMEs in Sri Lanka. The issue here is that it was not conducted in Nigeria and data was analyzed using Partial Least Squares-Structural Equation Modelling (PLSSEM), whereas this present study made use of descriptive statistical tools such as tables and frequencies and regression analysis.

Igbaekemen (2020), examined Impact of Information Communication Technology on SMEs in Nigeria. The study employed the use of only secondary data. From the context of this study, a sound conclusion was drawn with an emphasis that ICT has a great influence on productivity in the SME industry in Nigeria. Hence, based on the research overviewed it is noted that Stakeholders in the SME industry agree that the introduction of ICT in its operation changes its process and productivity which in turn boosts profitability. It was recommended that there is an urgent and dire need for the government to revamp the SME sector of the economy in order to redress the growing unemployment rate in the country, reduce the poverty level, enhance the standard of living, and stimulate economic growth and development. The limitation of the study above is that it is a literature review that made use of only secondary sources of data in concluding but this present study is empirical in nature and made use of primary data in drawing conclusions.

Abur (2020), examined the effect of Infrastructure Deficit and the Performance of SMEs in the Post COVID-19 Nigerian Economy. The study is aimed at identifying the state of infrastructure (ICT, Water, and Electricity) and the effect of infrastructure deficit on the performance of small and medium-sized enterprises in three key states in Nigeria, this includes; Lagos, Kano, and Kaduna State. Three stages random sampling technique was employed to select 750 SMEs in Nigeria. The study employed descriptive statistics and the Cobb-Douglas Production Function to analyze data. The descriptive statistics results show that 88.9 percent of the SMEs emphasized that the state of infrastructure is poor in Nigeria while 79.1 percent of SMEs opined that the poor state of infrastructure increased their cost of operation in the post-COVID-19. The Cobb-Douglas Production Function result showed that infrastructure deficit hurts the performance of small and medium-sized enterprises in Nigeria in post-COVID-19. The study concludes that infrastructure has a multiplier effect on SMEs 'income. Deficiency infrastructure hampered the development of SMEs and this translates into a fall in income, low revenue to the government as well as increased unemployment. The study above was conducted in Lagos, Kano and Kaduna states with variables like ICT, water, and Electricity while this present study was conducted in six of the North-Central States and FCT in Nigeria with variables like ICT, Electricity, Transportation, Education and Health Infrastructure.

Megha and Zaware (2019), researched the impact of implementing ICT in organizations for improving organizational performance. The purpose of the study is to analyze the impact of information and communication technologies on the organizational performance of enterprises. The study was a combination of qualitative and quantitative research. A due level of quantification has been used in the study to reach objective and measurable conclusions. Primary data was collected through a survey questionnaire from a sample of 400 employees of IT companies from Pune. The results obtained show that Information & Communication Technologies have significant positive effects on the growth of companies. This implies that there is a need for organizations to invest in ICT in order to set themselves apart from their competitors and also have a sustainable competitive advantage. The critic here is that the study was conducted in IT companies in Pune which is outside the shores of Nigeria. The present study was carried out in all registered SMEs in North-Central, Nigeria.

Oyebiyi (2019), researched on the use of information and communication technology by SMEs in Ogun State, Nigeria. The purpose of this study is to examine the factors promoting and inhibiting the use of ICT among SMEs in Abeokuta and Otta, Ogun state. Survey data were collected from 75 SME ICT users and non-users in Abeokuta and Otta through a structured questionnaire using a stratified random sampling technique. Out of the 80 copies of questionnaires administered 75 were correctly completed. Results of regression analysis revealed that the demographic variable (Staff Strength) significantly influences the use of ICT among SMEs while SME service delivery had no influence on ICT use. It was recommended that the ICT industry must intermittently develop ways of making SME owners/managers realize the supplementary value and latent benefits inherent in the use of appropriate ICT while also developing products and services targeted at addressing specific business needs. The limitation of the above study is that it was conducted only in Ogun state with a smaller sample size while this present study was carried out in all registered SMEs in North-Central Nigeria with a larger sample size.

Dampana and Agbeyegbe (2017), examined the effects of Information Communication Technology on employee performance in an organization. The paper adopted the descriptive survey design in achieving the stated objective. The population of this study consists of 50 staff of the study organization with a sample size of 34 drawn via a simple random sampling technique. The questionnaire method was used in collecting the data. The data obtained were analyzed with particular reference to the research questions using descriptive statistical tools such as tables and frequencies. The findings show that Information and Communication Technology has improved the skills of workers in the bank thereby improving employee's performance, and that Information and Communication Technology has brought new techniques in all Areas of the Banks by improving the banking operation. Based on the findings, the researcher recommended that banks should improve more on their information technology to enhance their productivity, the use of (ICT), in the banking sector should not only be restricted to the cities alone, rural banking should also be improved upon. The limitation of the research above is that it was conducted in the banking sector with a small sample size of 34. So, this study was replicated in SMEs with a larger sample size for easy generalization.

Murat and Opusunj (2017), examined the impact of information and communication technology on the performance of SMEs in Abuja. The study used a descriptive survey designed and employed the use of a questionnaire administered to the respondents who are the owners of SMEs. The population of the study was 26000 (SEMDAN, 2013), and this was reduced to 393 (as the required sample size) using the Taro Yamane formula. The study adopted a simple random sampling technique to administer the questionnaire. E-view software statistical software package and multiple regressions were used to analyze the data. It was concluded from the findings that there is a significant relationship between information technology infrastructure and the performance of SMEs in Abuja. The study recommended among others that SMEs should continually use information and communication technology in terms of the services, infrastructure, and user skills since it contributes significantly to the performance of SMEs in terms of increase in sales, increases in patronage, market share, and output. The limitation of the study above shows

that it only covers SMEs in Abuja while the present study covered all registered SMEs in North-Central States, Nigeria.

Karungan and Ochiri (2017), researched on the impact of ICT infrastructure support on organizational performance. A quantitative research design and a survey strategy were used. The research employed purposive sampling to select 87 employees in Nairobi County Government to participate in the research. Data was collected using simple structured questionnaires and analyzed using descriptive and regression analysis. Research findings showed that ICT infrastructure enhances organizational performance. The findings also showed that a robust ICT infrastructure in procurement improves communication, enhances efficiency, enhances monitoring and control, makes work easier as well as improves service delivery. It was recommended that organizations utilize ICT to enhance their procurement function for better performance, efficiency, and effectiveness. The critic of the study above is that its respondent was employees in Nairobi County Government with a smaller sample size and outside the shores of Nigeria while in this study, the respondents were owners/managers of SMEs in North-Central, Nigeria with a larger sample size.

### 3.0 METHODOLOGY

The study employed cross-sectional survey design. The population of this study was drawn from all registered SMEs in the North-Central States and FCT that were registered with SMEDAN. The target population of the study comprised 218,441 registered SMEs in the six states and FCT of North-Central Nigeria with a sample size of 399 SMEs owners/managers determined using Taro Yamane (1974) formula. A simple random sampling technique was used for sample selection. Structure questionnaire serve as a data collection instrument which was administered by the researcher and research assistants. The response of each item in the questionnaire were based on a 5-point rating scale. The instrument was subjected to face and content validity. 1/3 of the sample size was used to carry out a pilot study while Cronbach Alpha and Factor Analysis were equally used to ensure reliability and validity of the instrument respectively. The data collected for the study were analyzed using computer based Statistical Package for Social Sciences (SPSS) version 23, descriptive statistical tools such as tables, charts, simple percentages, and frequencies were also used while multiple regression analysis were used for further analysis and test of hypotheses at 0.05 level of significance.

The dependent variable which infrastructural development is a function of survival and the implicit form of the model is given below;

$$S = f (ID).....(1)$$

Where:

S = Survival (dependent variable)

ID = Infrastructural Development (independent variable)

The implicit form of the model is given below;

$$S = f (ICT)..... (2)$$

Where:

S = Survival

ICT =Information and Communication Technology

Explicitly, the models are depicted below:

$$\text{Survival} = \beta_0 + \beta_1 \text{ICT} + e \dots \dots \dots (3)$$

Where:

$\beta_0$  = Y intercept value of the dependent variable

$\beta_1$  = the regression coefficients of the independent variables...

a prior expectations are  $\beta_1 > 0$ .

e = the random error

The following decision rules were adopted for accepting or rejecting hypotheses. If the standard error of  $b_i [S(b_i) > 1/2b_i]$  we accept the null hypothesis, that is we accept that the estimate  $b_i$  is not statistically significant at the 5% (0.05) level of significance. If the standard error of  $b_i [S(b_i) < 1/2b_i]$  we reject the null hypothesis, in other words, we accept that the estimate  $b_i$  is statistically significant at the 5% (0.05) level of significance.

**4.0 RESULT AND DISCUSSION**

The data obtained during the field survey was presented and analyzed using both descriptive and inferential analysis.

**4.1 Presentation of Responses on Research Variable**

The study collected data from the respondents on the research variable on information and communication technology infrastructure and innovation. The results were presented responses on a five-point likert scale of strongly agree, agree, uncertain, disagree and strongly disagree and means and standard deviations.

**Table 1: Responses on Information and Communication Technology (ICT)**

Questions	Responses						Std. Dev
	SA	A	N	D	SD	M	
Computer systems help your company to run inventory, control accounting and manage human resources.	155	160	56	12	16	4.07	1.004
Internet services have provided your business the opportunity to carry out online services and online marketing to your target market.	164	142	51	18	24	4.01	1.124
Mobile phones offer a quick, efficient and affordable way of communication to your business.	141	165	48	27	18	3.96	1.073
Mobile phone helps my business to maintain customer relationship, facilitate market transactions and communicate product information to customers.	159	135	54	37	14	3.97	1.106
E-mail, e-commerce, and social media network helps my business to cut down on the physical movement involved in dispatching of mails, advertising and ordering of goods.	129	175	48	31	16	3.93	1.055

**Source:** Field Work (2023)

The result in Table 1 showed respondents' views on the effect of information and communication technology on survival of SMEs in North-Central, Nigeria. In finding out if Computer systems help your company to run inventory, control accounting and



manage human resources., majority of the respondents 160 (40.1 %) agreed and 155 (38.8 %) strongly agreed while only few 7 % disagreed. The result had a mean response of 4.07 with a standard deviation of 1.004. This means that majority of the SMEs surveyed use computer systems in their business operations. Finding out if Internet services have provided your business the opportunity to carry out online services and online marketing to your target market, majority of the respondents 76.7 % (41.1%+35.6%) agreed. The results had a mean response of 4.01 with a standard deviation of 1.124. Also, finding out if mobile phones offer a quick, efficient and affordable way of communication to your business. % (32.3%+41.4%) of the respondents agreed with a mean score of 3.96 and a standard deviation of 1.073. In finding out if mobile phone helps my business to maintain customer relationship, facilitate market transactions and communicate product information to customers, 73.6 % (39.8 %+33.8 %) agreed with a mean response of 3.97 and a standard deviation of 1.106. The result further revealed that majority of the respondents 76.2 % (32.3%+43.9%) agreed to the statement that e-mail, e-commerce, and social media network helps my business to cut down on the physical movement involved in dispatching of mails, advertising and ordering of goods.. The results had a mean response of 3.93 with a standard deviation of 1.055.

**Table 2: Responses on Innovation**

Questions	Responses						
	SA	A	N	D	SD	Mean	Std. Dev
Your business often design and deliver new products to meet current changes with the help of modern ICT facilities.	17 5	119	56	29	20	4.00	1.151
Your business has improved in creativity with the aid of research and development units.	17 8	132	40	37	12	4.07	1.089
Innovation Programmes and processes give my business the competitive edge over other competitors in the industry.	18 9	104	49	41	16	4.03	1.171
Your business imbibes the innovation culture of having regular meetings with employees, collective decision making and reward for excellence and hard work.	19 3	140	31	23	12	4.20	1.012
Your business often introduces new marketing strategies involving changes in product packaging, product placement and promotional activities.	19 8	105	40	34	22	4.06	1.197

**Source:** Filed Work (2023)

Table 2 shows responses collected from respondents on innovation. Finding out if your business often design and deliver new products to meet current changes with the help of modern ICT facilities, 43.9% of the respondents strongly agreed, 29.8 % agreed, 14.0 % were uncertain, 7.3 % disagreed while only 5.0 % strongly disagreed. The result has

a mean of 4.00 and standard deviation of 1.151. Finding out if your business has improved in creativity with the aid of research and development units, 44.6 % of the respondents strongly agreed and 33.1 % agreed while 9.3 % disagreed and 3.0 % strongly disagreed. The result has a mean of 4.07 and standard deviation of 1.089. Finding out if innovation programmes and processes give my business the competitive edge over other competitors in the industry, majority of the respondents 47.4 % agreed, 26.1 % strongly agreed while 10.3 % disagreed and 4.0 % strongly disagreed with a mean score of 4.03 and standard deviation of 1.171. Finding out if the businesses the business imbibes the innovation culture of having regular meetings with employees, collective decision making and reward for excellence and hard work, 48.4 % strongly agreed, 35.1 % agreed, 7.8 % uncertain while 5.8 % disagreed and 3.0 % strongly disagreed. The result has a mean of 4.20 and standard deviation of 1.012. In finding out if your business often introduces new marketing strategies involving changes in product packaging, product placement and promotional activities, 49.6 % of the respondents strongly agreed, 26.3 % agreed, and 10 % neutral while 8.5 % disagreed and 5.5 % strongly disagreed. The result has a mean of 4.06 and standard deviation of 1.197.

#### 4.2 Diagnostic Tests

Before carrying out a regression test, certain assumptions must be met to ensure that the results are not spurious. The normality and multicollinearity tests are conducted in this section.

##### i. Normality Tests

The descriptive measures used in this study included the minimum, maximum, mean and standard deviation. To test for the normality of data, skewness, and kurtosis were used.

**Table 3: Test for Normality using Skewness/Kurtosis**

Variable	N	Min	Max	Mean	Std. Dev.	Skewness	Kurtosis
ICT	399	1	5	4.04	1.034	-1.085	3.285
Business Survival	399	1	5	3.96	1.059	-1.229	3.204

**Source:** Researcher's Computation using SPSS Output, 2023

Table 3 displays the descriptive statistics highlighting the means, minimum, maximum, and standard deviation of the data. The descriptive statistics of the variables as provided indicates that business survival is the dependent variable and information and communication technology infrastructure are the predictor variable. The means and standard deviation scores for information and communication technology (M=4.04, SD=1.034), business survival are (M=3.96, SD=1.059). The mean scores and standard deviation indicate the level of agreement of respondents with the questions. Meanwhile, the minimum and maximum values are consistently 1 and 5 for all the variables considered in this study. It also shows very low dispersion among the responses as shown in the low standard deviations of all the variables under consideration. This supports the agreement of the respondents in giving responses to all the questions raised in this research work. The result in Table 3 also shows the test of normality based

on the Skewness Statistic and Kurtosis Statistic. To check the level of skewness and kurtosis for the variables, if skewness is less than -1 or greater than 1, the distribution is skewed. If skewness is between -1 and -0.5 or between 0.5 and 1, the distribution is moderately skewed. If skewness is between -0.5 and 0.5, the distribution is approximately symmetric. In Table 3 the skewness value for information and communication technology is -1.085 while for business survival, the skewness value is -1.229. From the result in Table 3, the distributions of the variables are negatively skewed. However, as a result of the large sample size, we make an assumption of normality for the use of multiple regressions. The assumption is that kurtosis values should be within range of  $\pm 7$  and therefore fail to display excessive kurtosis. According to Baltangi (2005) the data is normally distributed if the p value is greater than 0.05 otherwise there is some departure from normality.

**ii. Test for Multicollinearity**

Variance Inflation Factor (VIF) was used to analyze for multicollinearity among the independent variables used in the study. The outcomes are shown in Table 4 below

**Table 4: Test for Multicollinearity**

Model	Collinearity Statistics Tolerance	VIF
Information and Communication Technology	.927	1.079

**Source:** Researcher’s Computation using SPSS output, 2023

This VIF result confirms that there are no problems of multicollinearity amongst the independent variables (information and information technology) used in the models because the values are less than 5

**4.3 Regression Analysis**

This sub-section presents the results of regression analysis of the model used in the study. The regression model explains the degree of effect of the predictor variables (information and information technology infrastructure) on the dependent variable (survival). The result is presented in the model summary, analysis of variance and coefficients tables.

**Table 5: Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin Watson
1	.901	.791	.785	.760	1.728

- a. Predictors: (Constant) Information and Communication Technology
- b. Dependent Variable: Survival

**Source:** Researcher’s Computation using SPSS Output, 2023

The result in Table 5 shows the regression model summary. The model summary shows that the R Square = 0.791 which indicates that infrastructural development dimension (information and information technology) explained 79.1% of the variation in survival of SMEs. The remaining 20.9% is explained by other variables outside the model. The result implies that infrastructural development dimension is a significant predictor of survival. The value of R= .901 also indicates that there is a strong positive correlation between the variables of the study.

**Table 6: Analysis of Variance (ANOVA)**

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	219.264	1	43.853	75.917	.000
Residual	227.012	393	.578		
Total	446.276	398			

a. Dependent Variable: Survival

b. Predictors: (Constant), ICT

**Source:** Researcher's Computation using SPSS Output, 2023.

Table 6 shows the result of the (ANOVA) which indicates that  $F(5, 393) = 43.853$  (which is greater than the critical  $F$  value of 2.42) and  $p$ -value = 0.000 (which was less than 0.05.) The study therefore shows that the model had goodness of fit. The result further implies that infrastructural development dimension (information and communication technology) significantly explained changes in survival of SMEs and the model was statistically significant and adequate.

**Table 7: Regression Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.770	.216		3.561	.000
ICT	.242	.043	.141	3.266	.001

a. Dependent Variable: Survival

**Source:** Researcher's Computation using SPSS Output, 2023.

Regression coefficients in Table 7, revealed that there was a positive and significant effect of information and communication technology on the survival of SMEs ( $\beta = 0.141$ ,  $p=0.001$ ). The coefficient for information and communication technology (0.242) implies that a unit increase in implementation of information and communication technology would lead to 24.2 % increase in survival of SMEs. The effect is statistically significant ( $P$ -value =  $0.001 < 0.05$ ). This is supported by a calculated  $t$ -statistic of 3.266 which is larger than the critical  $t$ -statistic of 1.96.

#### 4.4 Test of Hypothesis and Discussion of Findings

**H<sub>01</sub>:** Information and communication technology (ICT) infrastructure has no significant effect on the survival of SMEs in North-Central, Nigeria.

To test the effect of information and communication technology (ICT) on survival of SMEs in North-Central, Nigeria. The result in Table 6 showed that  $\beta = 0.141$ ,  $t = 3.266$  and  $\text{sig} = 0.001$ . Since the  $p$ -value is less than 0.05 and  $t$ -statistic is greater than 2 at significance level of 0.05, this implies survival of SMEs is significantly affected by information and communication technology infrastructure. Findings obtained from the test of hypothesis revealed that ICT had a positive significant effect on the survival of SMEs in North-Central, Nigeria. This revealed that the survival of SMEs in North-Central, Nigeria is significantly affected by computerized technology such as computer system, internet services, mobile phones, e-mail, e-commerce and social media networking. The result is in agreement with Ranatunga *et al.* (2021), whose findings affirmed how information and communications technology usage affects the bounded rationality and business performance of SMEs in Sri Lanka. The result corroborated that of Igbaekemen (2020),

whose findings revealed that ICT has a great influence on productivity in the SMEs industry in Nigeria. The result further concurs that of Abur (2020), whose outcome showed that 88.9 percent of the SMEs emphasized that the state of infrastructure is poor in Nigeria while 79.1 percent of SMEs opined that the poor state of infrastructure increased their cost of operation in the post-COVID-19 and that infrastructure has a multiplier effect on SMEs income.

## **5.0 CONCLUSION AND RECOMMENDATION**

### **5.1 Conclusion**

Based on the findings of the analysis of the study, the study concluded that infrastructural development plays a significant and positive role in the survival of SMEs in North-Central, Nigeria. Infrastructure is one of the most important factors in any organization be it small or medium. Only when the relevant infrastructures are adequately provided that the goals and the objectives of the organizations be achieved. The findings presented above reveal that ICT infrastructure which was investigated in this study has a positive significant effect on the survival of SMEs in North-Central, Nigeria. It was evident from the results above that computer system, internet services, mobile phones, e-mail, e-commerce, and social media contribute to a large extent to the survival of SMEs in North-Central, Nigeria. It was therefore concluded that Infrastructural development has a positive significant effect on the survival of SMEs in North-Central, Nigeria.

### **5.2 Recommendation**

Based on the findings of the study and taking cognizance of the importance of the subject matter under study, the researcher recommended that; SMEs promoters should tailor ICT capacity building programs that encourage partnership with specialized ICT organizations, Non-Governmental Organisations (NGOs) among others in building on modern trends and utilization of ICT tools through webinar/seminars, workshops, and conferences. These skills acquired by workers will help to create and deliver products and services, enhance efficiency, reduce costs, and broaden the market both locally and globally for SMEs promoters.

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